HIGHLIGHTS

REVISION NO. 33 Jun 01/10

Pages which have been revised are outlined below, together with the Highlights of the Revision

CH/SE/SU C PAGES	REASON FOR CHANGE	EFFECTIVITY
CHAPTER 74		
L.E.P. 1- 1	Revised to Reflect this revision indicating new,revised, and/or deleted pages	
74-21-02 403	Layout improved	

CHAPTER 74

IGNITION

LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively
Remove and insert the affected pages and complete the Record of Revisions and the Record of Temporary Revisions as necessary

CH/SE/SU	C	PAGE	DATE
RECORD			
OF TEMP.			
REVISION			
L.E.P.	R	1- 1	Jun01/10
T. of C.		1	Jun01/04
T. of C.		2	Jun01/04
74-00-00		1	Jun01/04
74-00-00		2	Jun01/04
74-00-00		3	Jun01/04
74-00-00		4	Jun01/04
74-00-00		5	Jun01/04
74-00-00		6	Jun01/04
74-00-00		501	Jun01/04
74-00-00		502	Jun01/04
74-00-00		503	Jun01/04
74-00-00		504	Jun01/04
74-00-00		601	Jun01/04
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74-00-00		603	Dec01/06
74-00-00		604	Dec01/06
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74-00-00		606	Dec01/06
74-00-00		607	Dec01/06
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74-00-00		610	Dec01/06
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74-00-00		802	Jun01/04
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74-10-00		3	Jun01/04
74-10-00		4	Jun01/04
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CHAPTER 74

IGNITION

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SUBJECT	CH/SE/SU	C	PAGE	EFFECTIVITY
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Description			1	101-200,

IGNITION - GENERAL - DESCRIPTION AND OPERATION

1. General (Ref. Fig. 003)
(Ref. Fig. 001)
(Ref. Fig. 002)

The ignition system consists of two independent exciters, two high-tension leads and two igniters. The exciters are designed for 4 joule continuous duty operation. Each exciter is AC powered and fires one recessed-gap spark igniter through an air-cooled steel conduit high-tension lead. Each exciter is contained in a separate housing and mounted on vibration isolators that attach to a bracket on main gearbox.

Both systems can be used either simultaneously or individually. They are monitored from ENG panel (429VU) located on the overhead panel.

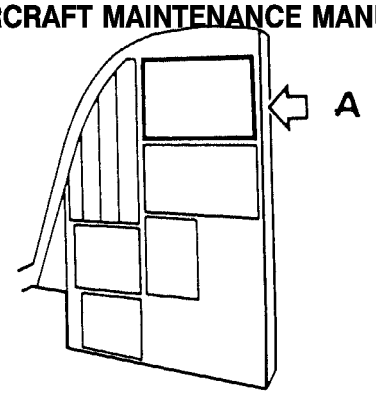
These systems are used during engine start, engine relight and every time the ambient conditions require a continuous ignition, to avoid any risk of flame out.

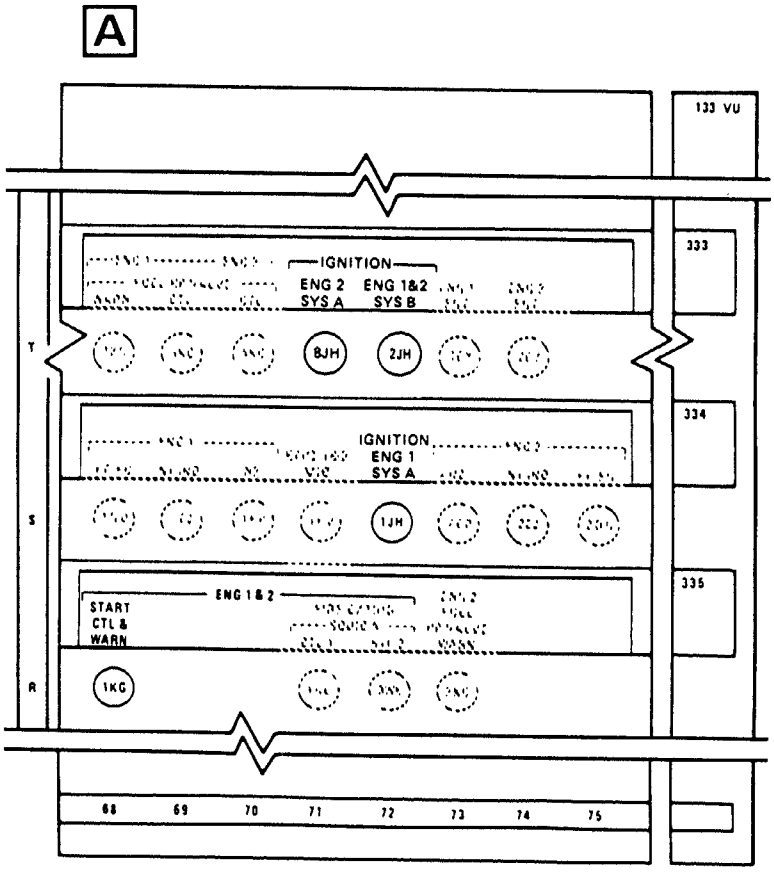
2. Ignition Exciter

The ignition exciter consists of a conducted radio noise filter, a power transformer, rectifiers, storage capacitor, trigger capacitor, discharge tube, trigger transformer and bleed resistors. All components are enclosed in a hermetically sealed housing with individual power input and high-tension output connections.

Both ignition exciters are mounted together on the same bracket which is located on the upper right side of gearbox.

3. FCOM (Ref. Fig. 004)





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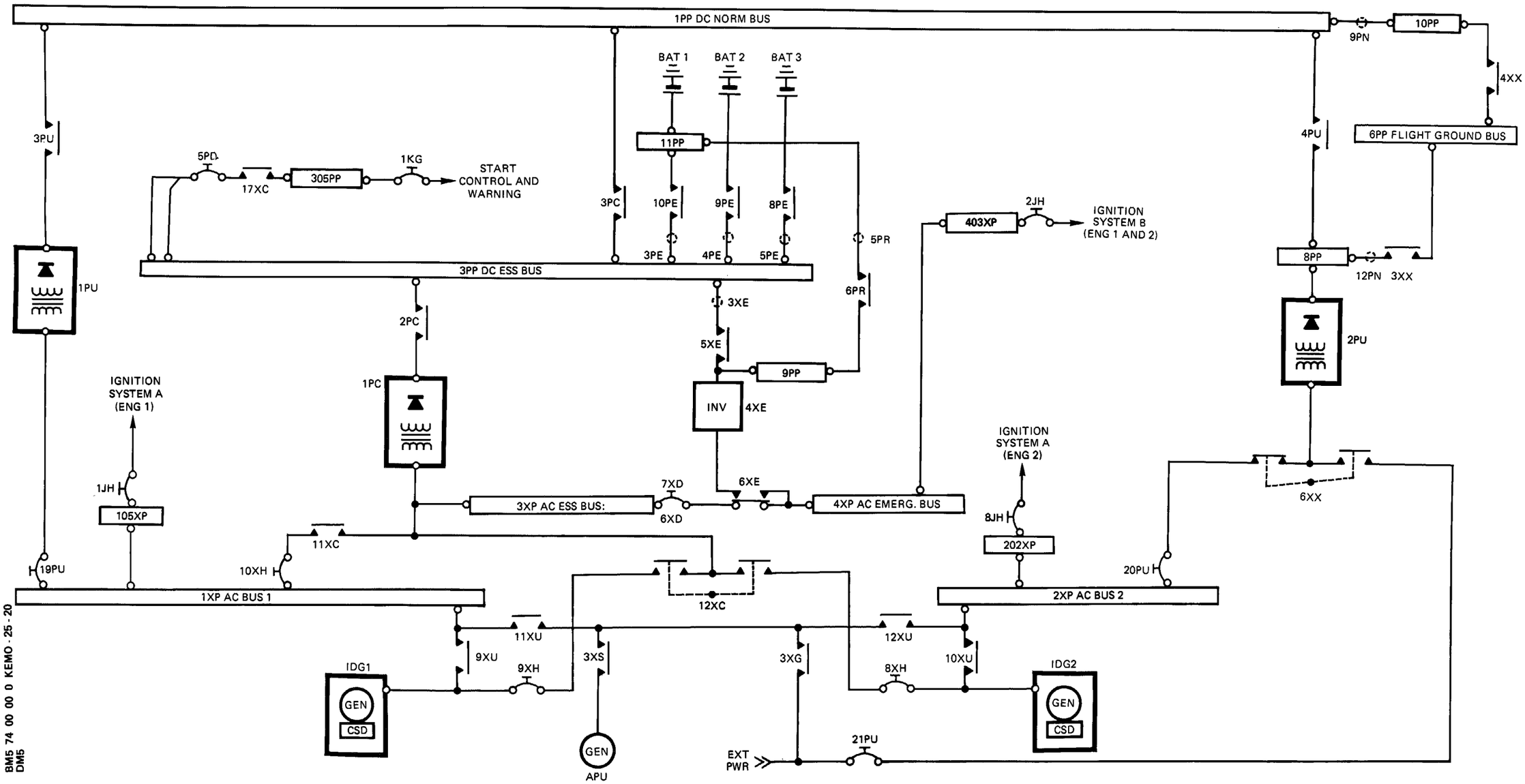
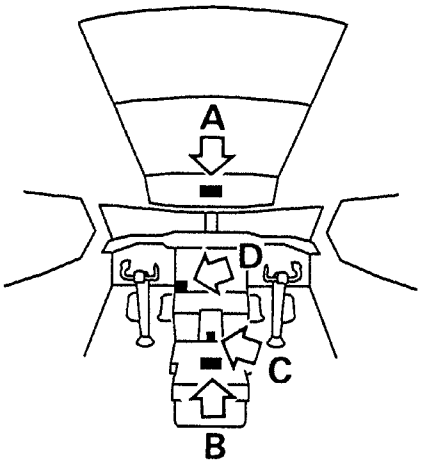
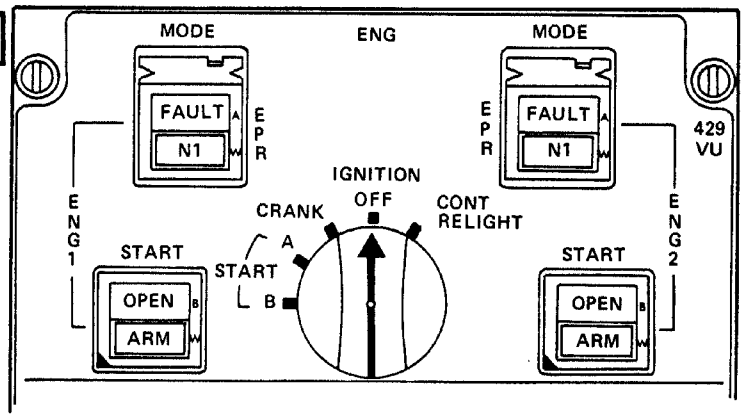
Circuit Breaker Panel 133VU - Component Location
Figure 001



Ignition System - Electrical Supply
Figure 002



A



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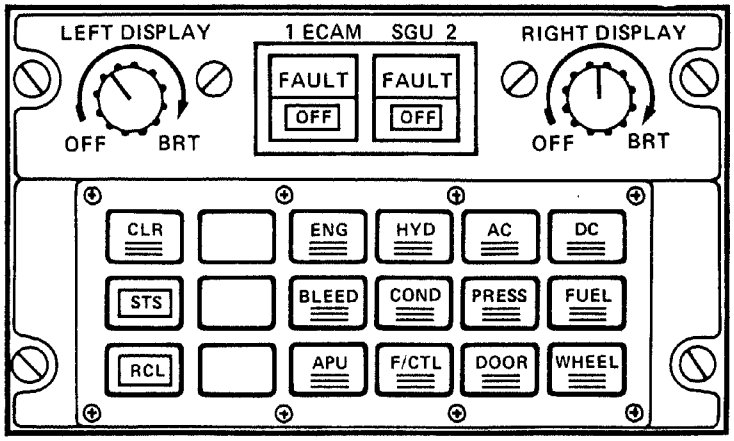

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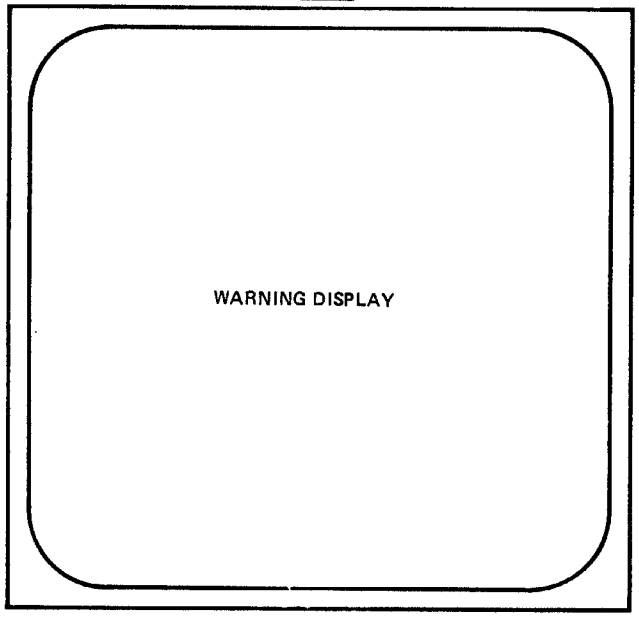

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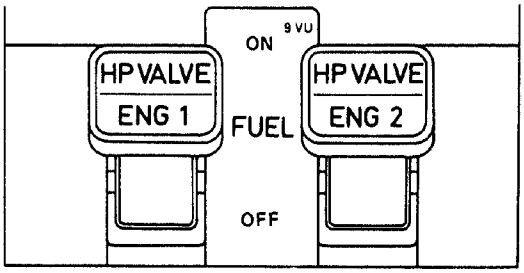

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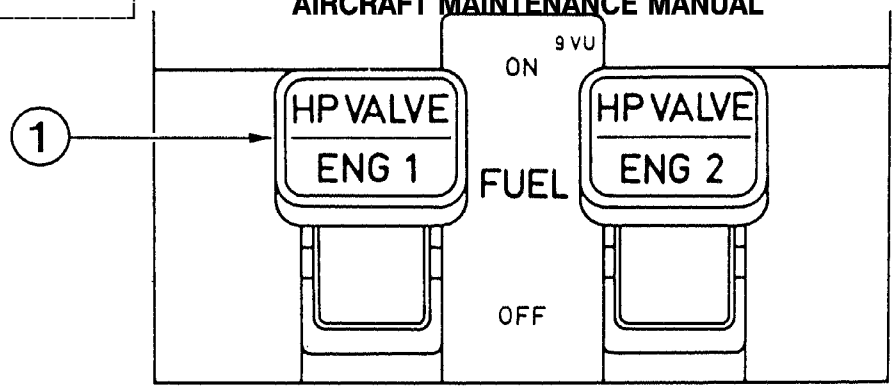
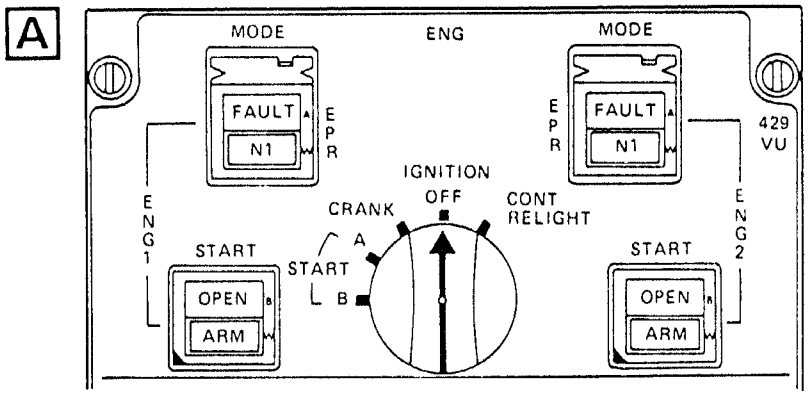
Indicators and Controls - Component Location
Figure 003



A. HP FUEL SHUT OFF VALVE CONTROL LEVER (1)
(1) ON
PERMITS IGNITION CIRCUITS OF THE CORRESPONDING ENGINE TO BE ELECTRICALLY SUPPLIED.
(2) OFF
IGNITION SYSTEMS A AND B OF THE CORRESPONDING ENGINE ARE INHIBITED.
NOTE : THESE LEVERS ALSO CONTROL FUEL SUPPLY TO COMBUSTION CHAMBER (REF. 76-00-00, P. BLOCK 1).



B. ENG (IGNITION) SELECTOR SWITCH (1)
USED TO SELECT IGNITION MODE REQUIRED (FOR BOTH ENGINES SIMULTANEOUSLY).

1 – OFF
IGNITION SYSTEMS OF BOTH ENGINES INHIBITED. LATCHING OF START 1 (2) PUSHBUTTON SWITCHES INHIBITED.

2 – CRANK
IGNITION SYSTEMS OF BOTH ENGINES INHIBITED
BUT START SEQUENCE CAN BE INITIATED FOR DRY OR WET MOTORING CYCLES (REF. 80.00.00, P. BLOCK 1).
· CLOSE AIR CONDITIONING PACK VALVES.

3 – START A (B)
IGNITION SYSTEMS A (B) WILL BE ENERGIZED DURING ENGINE START SEQUENCE ONLY (REF. 80.00.00, P. BLOCK 1).
CLOSE AIR CONDITIONING PACK VALVES.

4 – CONT RELIGHT
IGNITION SYSTEMS A AND B ENERGIZED CONTINOUSLY PROVIDED THE CORRESPONDING HP FUEL SHUT OFF VALVE CONTROL LEVER IS IN ON POSITION.

NOTE : IRRESPECTIVE OF HP FUEL SHUT OFF VALVE CONTROL LEVER POSITION, THE LEFT ECAM DISPLAY UNIT WILL SHOW THE MEMO CONTINUOUS RELIGHT ON.

Ignition (ENG) Selector Switch
Figure 004

1. Operational Test

A. Reason for the Job
Audio test of the ignition system to check for correct operation.

B. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedures	
- 24-41-00, P. Block 301	AC External Power Control
- 28-21-00, P. Block 1	Fuel Pump System
- 71-00-00, P. Block 501	Power Plant
- 71-13-00, P. Block 301	Cowl Doors

C. Procedure

WARNING : MAKE CERTAIN THAT FUEL PUMPS ARE INOPERATIVE (REF. 28-21-00, P. BLOCK 1).
BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT ELECTRICAL CIRCUIT UPON WHICH WORK IS IN PROGRESS IS ISOLATED.
MAKE CERTAIN THAT NO BLEED AIR IS CONNECTED TO GROUND CART AND APU BLEED AIR SWITCH IS IN OFF POSITION.

CAUTION : PRIOR TO AUDIBLE CHECK, MOTOR ENGINE IF UNBURNED FUEL IN ENGINE IS SUSPECTED. UNBURNED FUEL COULD RESULT IN AN INTERNAL ENGINE FIRE OR TAILPIPE FIRE.

(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Make certain that these following circuit breakers are closed :

PANEL	SERVICE	IDENT.	LOCATION
133VU	ENGINES/IGNITION/ENG2/SYS A	8JH	333/T71
133VU	ENGINES/IGNITION/ENG1&2/SYS B	2JH	333/T72
133VU	ENGINES/IGNITION/ENG1/SYS A	1JH	334/S72
133VU	ENGINES/ENG1&2/START/CTL & WARN	1KG	335/R68

(d)Open, safety and tag the following circuit breakers :

PANEL	SERVICE	IDENT.	LOCATION
133VU	ENGINES/ENG2/REVERSE/CTL	2KM	331/V74
133VU	ENGINES/ENG1/REVERSE/CTL	1KM	332/U69
133VU	ENGINES/ENG1/FUEL HP VALVE/CTL	3KC	333/T69
133VU	ENGINES/ENG2/FUEL HP VALVE/CTL	4KC	333/T70

(e)Perform a dry motoring (Ref. 71-00-00, P. Block 501).
(f)Open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

(2)Test of START A and START B systems

ACTION	RESULT
1. On ENG panel 429VU	
- place ENG IGNITION selector switch in START B position	- ARM legend of ENG1/START and ENG2/START pushbutton switch comes on
- press ENG1/START and ENG2/START pushbutton switch	- ARM legend goes off
2. On panel 9VU	
- place HP fuel shut off valve control levers 1 and 2 in ON position.	- on engines 1 and 2, plugs B produce normal sounds, proving that igniter plugs operate correctly.
- place HP fuel shut off valve control levers 1 and 2 in OFF position.	- on engines 1 and 2 igniter plugs B are cut off.
3. On panel 429VU	
- place ENG IGNITION selector switch in START A position.	- ARM legend of ENG1/START and ENG2/START pushbutton switch comes on.
- press ENG1/START and ENG2/START pushbutton switch.	- ARM legend goes off.
4. On panel 9VU	
- place HP fuel shut off valve control levers 1 and 2 in ON position.	- on engines 1 and 2, plugs A produce normal sounds proving that igniter plugs operate coorectly.
- place HP fuel shut off valve control levers 1 and 2 in OFF position.	- on engines 1 and 2 igniter plugs A are cut off.

(3)Test of CONT RELIGHT system

ACTION	RESULT
1. On panel 429VU	
- place ENG IGNITION selector switch in CONT RELIGHT position.	- ARM legend of ENG1/START and ENG2/START pushbutton switch comes on.
2. On panel 133VU	
- open IGNITION/ENG1/SYS A circuit breaker (1JH) (location 334/S72).	
- open IGNITION/ENG2/SYS A circuit breaker (8JH) (Location 333/T71).	
3. On panel 9VU	
- place HP fuel shut off valve control levers 1 and 2 in ON	- on engines 1 and 2, plugs B produce normal sounds proving that

ACTION	RESULT
position. - place HP fuel shut off valve control levers 1 and 2 in OFF position.	igniter plugs operate correctly. - on engines 1 and 2 igniter plugs B are cut off.
4. On panel 133VU - close circuit breaker 1JH and 8JH - open IGNITION/ENG1&2/SYS B circuit breaker (2JH) (location 333/T72)	
5. On panel 9VU - place HP fuel shut off valve control levers 1 and 2 in ON position. - place HP fuel shut off valve control levers 1 and 2 in OFF position.	- on engines 1 and 2 igniter plugs A produce normal sounds proving that igniter plugs operate correctly. - on engines 1 and 2 plugs A are cut off.
6. On panel 133VU - open IGNITION/ENG1/SYS A circuit breaker (1JH) (location 334/S72).	
7. On panel 9VU - place HP fuel shut off valve control levers 1 and 2 in ON position.	- on engine 2 only igniter plug A produces normal sounds, proving that igniter plug operates correctly.
8. On panel 133VU - open circuit breaker 8JH. - close circuit breaker 1JH.	- on engine 2 igniter plug A is cut off. - on engine 1 only igniter plug A produces normal sounds, proving that igniter plug operates correctly.
9. On panel 9VU - place HP fuel shut off valve control levers 1 and 2 in OFF position.	- on engine 1 igniter plug A is cut off.
10. On panel 133VU - close circuit breaker 2JH and 8JH.	
11. On panel 429VU - place ENG IGNITION selector switch in OFF position.	- ARM legend goes off.

(4)Close-up

(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Restore system and aircraft to normal operating condition.
(c)Remove safety clips and tags and close circuit breakers.
(d)Close thrust reverser and fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

IGNITION GENERAL - INSPECTION/CHECK

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 72-00-00, P. Block 601	Engine - General
- 74-11-01, P. Block 401	Ignition Exciters
- 74-11-01, P. Block 601	Ignition Exciters
- 74-21-01, P. Block 601	Exciter-to-Igniter Plug Cable
- 74-21-02, P. Block 601	Igniter Plug
- 74-21-01, P. Block 401	Exciter-to-Igniter Plug Cable
- 74-21-02, P. Block 401	Igniter Plug

2. Specific Fits and Clearances

A. General

(1) Reference numbers on figures indicate location of parts for which fits and clearances are specified. Description of, and limits for, these fits and clearances are located in tables of corresponding reference numbers.

(2) Unless otherwise specified, all fits are diametral except spline fits, which are calculated for chordal dimensions, and blade tip clearance, which is radial.

(3) Numbers in all columns shall be interpreted in in. and (millimeters).

(4) Letter "T" following limits indicates tight fit.

(5) Description column provides nomenclature for part or part concerned.

B. Inspection Frequency Requirements

(1) IFR column provides Inspection Frequency Requirements. Letter Codes A, B or C located in IFR column indicate manner and frequency of inspection recommended for item identified by adjacent reference number, as applicable to normal or routine repair.

IFR CODE	DEFINITION
A	Clearance or fit must be calculated from part measurements at each installation of parts. Part measurements taken and recorded at time of individual part inspection are considered equally as valid as measurements taken at time of part installation.
B	Clearance or fit must be estimated at each installation of parts. Use trial assembly or similar means to estimate clearance or fit. Measurement of parts and calculation of actual fit or clearance is required only if : - estimating procedure indicates that clearance or fit is outside specified tolerance, or

IFR CODE	DEFINITION
	- either or both mating parts involved have been replaced or repaired in an area or way which would affect the clearance or fit.
C	Fit not subject to change in normal engine operation. Measurement of parts and calculation of fit is required only if either of mating parts involved has been replaced or repaired in an area or way which would affect fit.

C. New Part Reference Dimensions
(1)Dimensions are provided in this column for reference only.
(2)Dimensions are the minimum and maximum manufacturing values in inches (and millimeters) for each part listed in the description column.

D. Limits
(1)Limits applicable to any combination of new or used parts.
(a)This column provides the acceptable (minimum-maximum) range of fit or clearance in inches (and millimeters). These limits may be applied to any combination of new or used parts.
(b)The limits are based on the mathematical combination of the minimum and maximum values specified in the New Part Reference Dimensions column. See Example 1.
(c)Limits which have been expanded to be less restrictive than new part conditions are identified with an asterisk (*) adjacent to the value. See Example 2.

EXAMPLE 1

Ref. No.	IFR	Description	New Part Reference Dimensions Min	Max	Limits Min	Max
1812		Bearing ---	0.508	0.512		
			(12.903)	(13.005)		
		Support ---	0.517	0.527	0.005	0.019
			(13.131)	(13.385)	(0.126)	(0.482)

NOTE : In Example 1 limits are determined by comparing bearing and support referenced dimensions as follows :

0.517	(-)	0.512	=	.005
(13.131)		(13.005)		(0.126)
.527	(-)	.508	=	.019
(13.385)		(12.903)		(0.482)

EXAMPLE 2

Ref. No.	IFR	Description	New Part Reference Dimensions Min	Max	Limits Min	Max
1812		Bearing ---	0.508 (12.903)	0.512 (13.005)		
		Support ---	0.517 (13.131)	0.527 (13.385)	0.005 (0.126)	0.020* (0.508)*

NOTE : In Example 2 limits represent less restrictive values as indicated by the asterisk (*).

(2)Limits for selective application to engines scheduled for partial refurbishment.

(a)A second set of limits enclosed by brackets and lines may be provided. See Example 3. These enclosed limits are less restrictive and are intended to be selectively applied to engines scheduled for partial refurbishment.

EXAMPLE 3

Ref. No.	IFR	Description	New Part Reference Dimensions Min	Max	Limits Min	Max
1812		Bearing ---	0.508 (12.903)	0.512 (13.005)		
		Support ---	0.517 (13.131)	0.527 (13.385)	0.005 (0.126)	0.019 (0.482)
				.005 (0.13)		.022 (0.56)

NOTE : In Example 3 the enclosed (less restrictive) limits are intended for selective application, see text.

E. Fits and Clearances (Ref. Fig. 601)

	Ref. No.	IFR	Description	New Part Reference Dimensions Min	Max	Limits Min	Max
R	282	B	Igniter Plug Outer Combustion Chamber Assembly (see Figure)				
R			Plug ---	.556 (14.122)	.562 (14.275)		
R			Chamber ---	.566	.576	.004	.020

	Ref. No.	IFR	Description	New Part Reference Dimensions Min - Max	Limits Min - Max
R	282	B	Igniter Plug		
R				(14.38) - 14.63)	(0.10) - (0.51)

F. Special Assembly Procedure

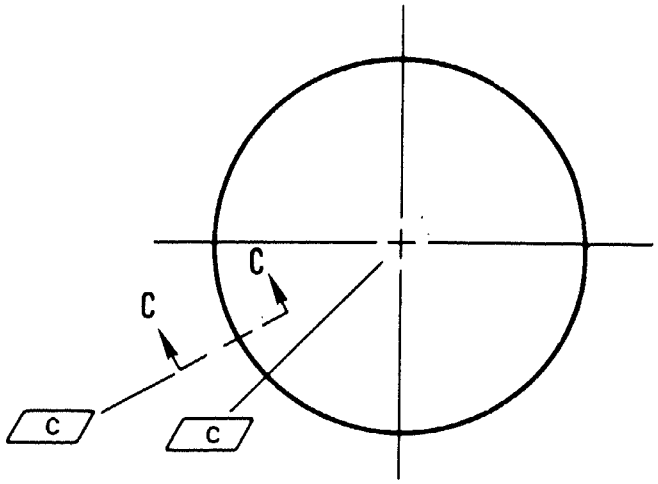
	Ref. No.	IFR	Description	New Part Reference Dimensions Min - Max	Limits Min - Max
R	365	A	Igniter Plug Fitting (See Figure) (Ref. 74-21-02, P. Block 401)		

G. Special Torques

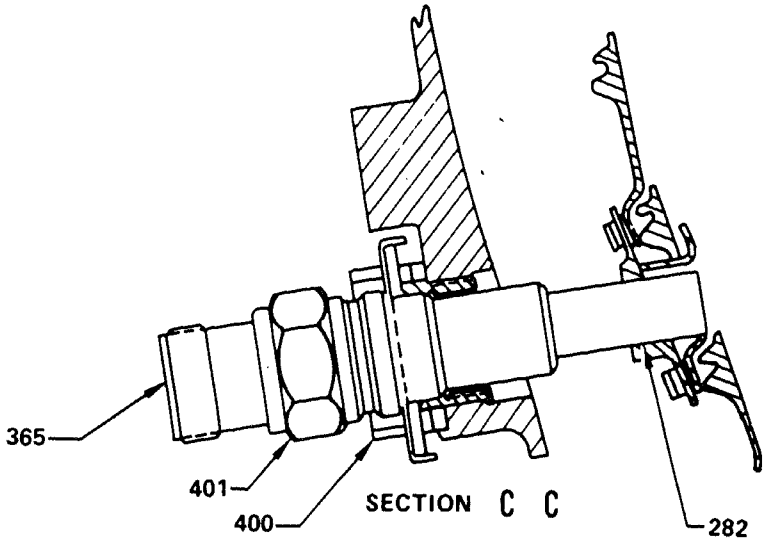
	Ref. No.	IFR	Description	New Part Reference Dimensions Min - Max	Limits Min - Max
R	400	A	Igniter Plug Boss (See Figure) (Ref. 74-21-02, P. Block 401)		
R	401	A	Igniter Plug (See Figure) (Ref. 74-21-02, P. Block 401)		
R	2151		Hose/Tube Clamp Screws (Ref. 74-11-01, P. Block 401) (Ref. 74-21-01, P. Block 401) (Ref. 74-21-02, P. Block 401)		

3. Inspect Ignition System

WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH, IGNITION SWITCH MUST BE IN OFF POSITION BEFORE REMOVAL OF ANY IGNITION COMPONENTS.



SCHEMATIC FRONT VIEW



SECTION C C

(TYPICAL 2 PLACES AT LOCATION C)

L-A2728

BM5 74 00 00 6 KALO - 24 - 19
DM5

Diffuser and Combustion
Figure 601

ALLOW SEVERAL MINUTES TO ELAPSE BETWEEN OPERATION OF THE IGNITION SYSTEM AND THE REMOVAL OF COMPONENTS. UPON DETACHING THE CABLE FROM THE IGNITER PLUG, DISCHARGE THE CURRENT BY GROUNDING THE CABLE TERMINAL TO ENSURE COMPLETE DISSIPATION OF ENERGY FROM THE SYSTEM. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN SEVERE INJURY TO PERSONNEL.

A. General

(1) The following inspection procedures are a normal function of operation organizations. The nature and conditions of engine operations determines the time interval between required inspections.

B. Job Set-Up

(1) Open, safety and tag circuit breakers for the appropriate engine and open fan and thrust reversers cowl doors (Ref. 71-13-00, P. Block 301).

C. Procedure (Ref. Fig. 602)

(1) Inspect ignition system for security of components, wire braid fraying, and for obstruction of cooling air passages.

(2) Inspect ignition exciter terminal well for arcing and tracking. (Ref. 74-11-01, P. Block 601).

(3) Inspect exciter-to-igniter plug cable terminal ends for arcing and tracking (Ref. 74-21-01, P. Block 601).

(4) Inspect igniter plug terminal well and tip erosion (Ref. 74-21-02, Block 601).

(5) Pre SB PW4ENG 72-601. If there are problems with the ignition system, inspect the combustion chamber guide to see if a part of the guide is gone as follows :

(a) Remove the igniter plug (Ref. 74-21-02, P. Block 401).

(b) Inspect the igniter guide to make sure the guide is all there. (Ref. Fig. 603). If the guide is all there, no more action is required. If part of the guide is missing, continue with the inspection.

NOTE : The diameter of the the guide is 0.566 - 0.576 in. (14.38 - 14.63 mm). The internal diameter of the sleeve that the guide rests on (or the opening if a portion of the guide is gone) is 0.890 - 0.920 in. (22.61 - 23.37 mm).

(c) Pre SB PW4ENG 72-449. Inspect the igniter guide to see how much of the guide is gone. It is typical to see that the center portion of the igniter guide has liberated into the gas path. For this type of missing guide, it is required that the HPT first stage blades be borescope inspected for impact damage that may have resulted from the liberated guide (Ref. 72-00-00, P. Block 601).

(d) Post SB PW4ENG 72-449. It is typical to see that the guide and guide shield (or housing) has liberated but is still trapped in position by the igniter plug, since the missing guide portion is too large to fall into the gas path. Therefore borescope inspection can be omitted.

(e) Upon removal of the igniter plug the liberated guide portion will typically fall into the bottom of the diffuser case assembly. It is recommended that the liberated guide be removed if it is readily accessible. Otherwise, the guide portion can be left in place until

the next scheduled overhaul.

NOTE : If the liberated guide is left in place, it is recommended that HPT and Combustor condition be monitored for any distress that may be caused by the missing guide plugging cooling passages.

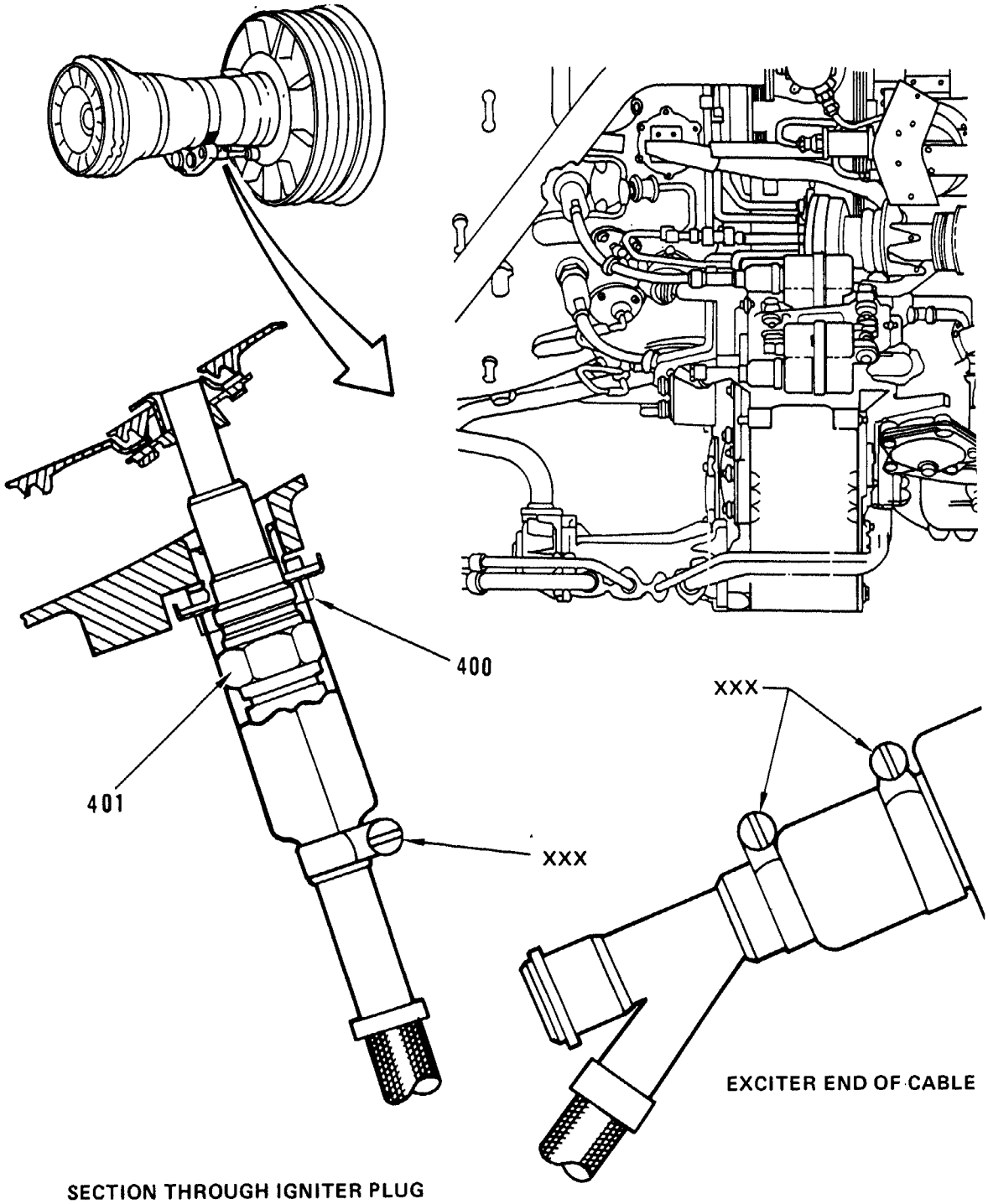
(6)Remove and visually inspect igniter guide and boss assemblies, at an interval not to be more than 7000 hours. See (Ref. Fig. 604) for damage and wear limits.

(7)At the next shop visit of the Diffuser Group, remove the boss and guide assembly, replace the igniter guide as specified in SB PW4ENG 72-601 and install spark igniter boss. If spacers were adjusted when installing igniter guide and boss assembly, it is necessary to reset igniter immersion to the correct value (Ref. 74-21-02, P. Block 401).

D. Close-Up

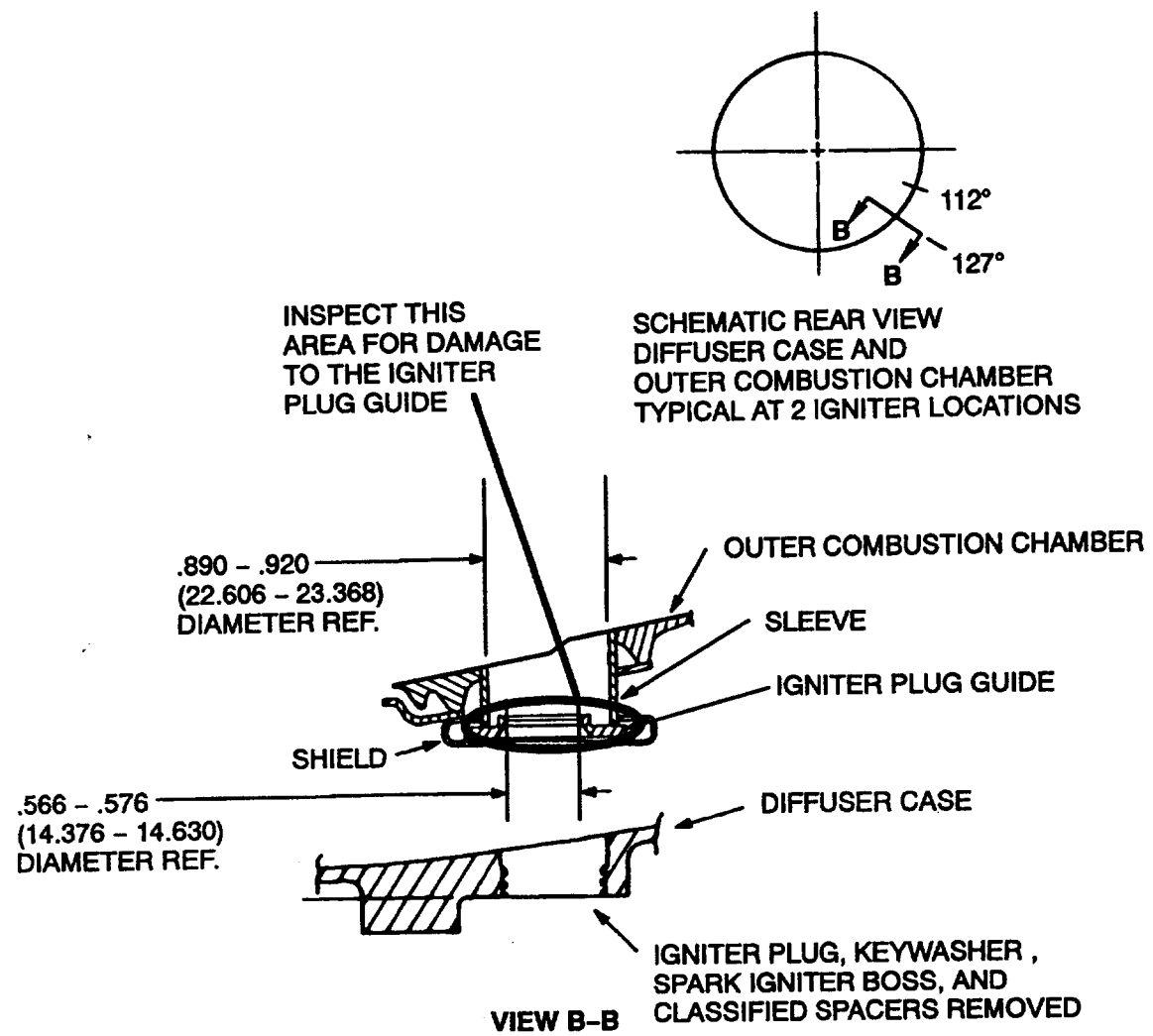
(1)Close thrust reverser and fan cowl doors. (Ref. 71-13-00, P. Block 301).

(2)Remove safety clips and tags and close circuit breakers.



BM5 74 00 00 6 KAMO - 20

Ignition System Clearance Chart
Figure 602

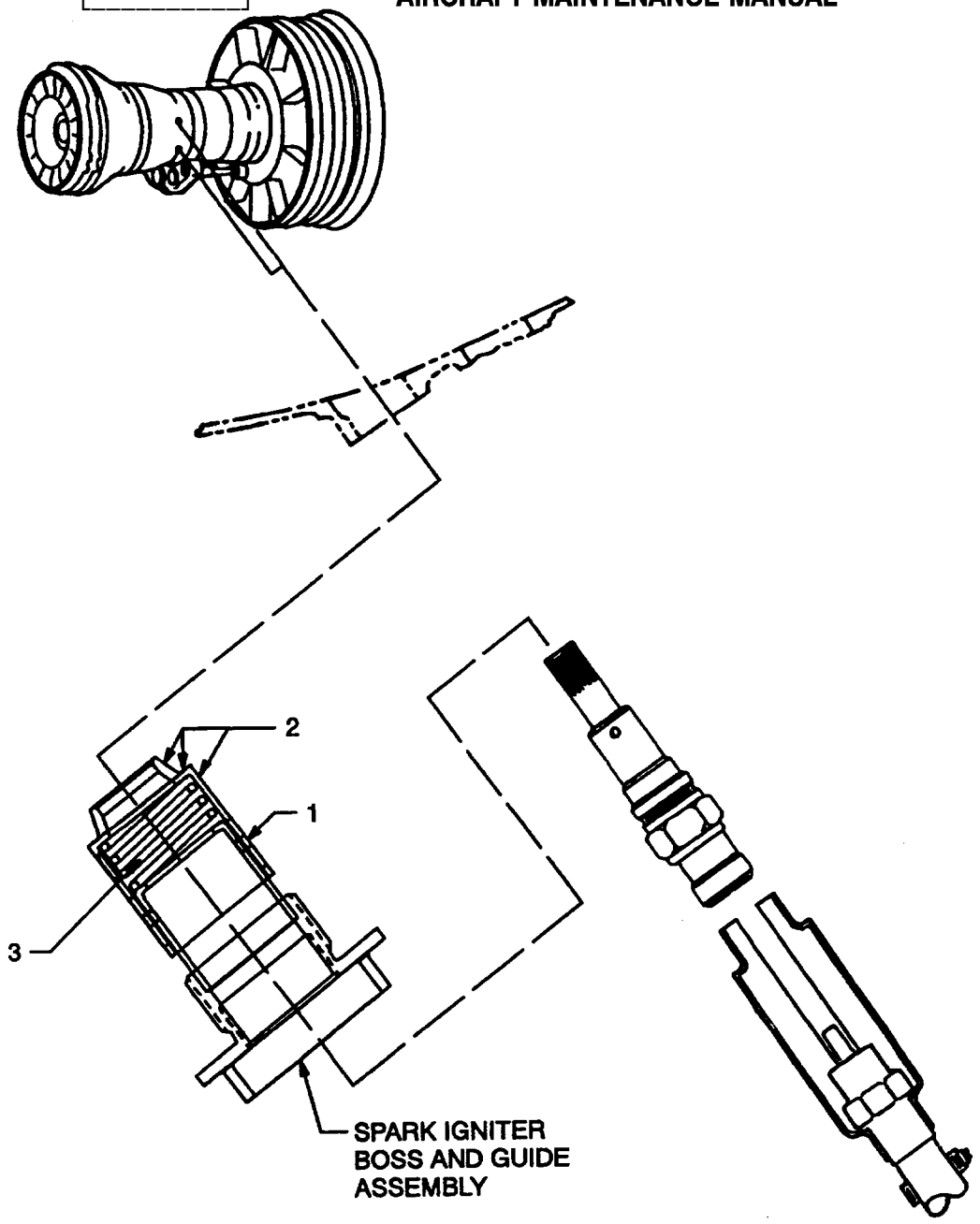

112°
B
B
127°
INSPECT THIS AREA FOR DAMAGE TO THE IGNITER PLUG GUIDE
SCHEMATIC REAR VIEW DIFFUSER CASE AND OUTER COMBUSTION CHAMBER TYPICAL AT 2 IGNITER LOCATIONS
.890 - .920 (22.606 - 23.368) DIAMETER REF.
OUTER COMBUSTION CHAMBER
SLEEVE
IGNITER PLUG GUIDE
SHIELD
.566 - .576 (14.376 - 14.630) DIAMETER REF.
DIFFUSER CASE
IGNITER PLUG, KEYWASHER, SPARK IGNITER BOSS, AND CLASSIFIED SPACERS REMOVED
VIEW B-B

VIEW SHOWING IGNITER PLUG GUIDE INTACT

BM5 74 00 00 6 KAP0 01

L-B8675 (0901)

Igniter Plug Guide Inspection
Figure 603



L-B8757 (1001)

BM5 74 00 00 6 KAR0 01

1. PIN - 4 PLACES. NO MISSIN PINS PERMITTED.
2. WEAR LOCATIONS (ALL AROUND). 0.025 IN. (0.0635 MM) MAX. DEPTH WEAR PERMITTED.
3. SPRING. NO SPRING DAMAGE PERMITTED.

Igniter Boss and Guide Assembly Visual Inspection
Figure 604

1. Repair Igniter Plug with Missing Guide (Pre SB PW4ENG 72-601)

A. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B. PWA75509	Immersion Gage
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 74-21-02, P. Block 601	Igniter Plug

B. Job Set-Up

(1)Open, safety and tag circuit breakers for the appropriate engine and open fan and thrust reversers cowl doors (Ref. 71-13-00, P. Block 301).

C. Procedure (Ref. Fig. 801, 802)

(1)Remove the spark plug igniter boss from the diffuser case at the location of the missing guide and keep the spacers for reinstallation (Ref. Fig. 801).

(2)Intall the spark igniter boss and guide assembly with a new key washer and the spacers that were used with the old igniter boss (Ref. Fig. 801).

NOTE : It is recommended that the following check be done before you install igniter boss and guide assembly, applicable to chambers that have missing guide and guide shield (seen in post SB PW4ENG 72-449 Chambers), to ensure that the igniter boss and guide assembly seals properly against the combustion chamber (Ref. Fig. 802).

(a)With PWA 75509 Immersion Gage, measure distance A from diffuser case igniter boss face and portion of combustion chamber igniter guide that remains.

(b)Measure distance B on igniter boss and guide assembly with spacers installed.

(c)If distance B is greater than distance A, the igniter boss and guide assembly will compress and seal properly when installed.

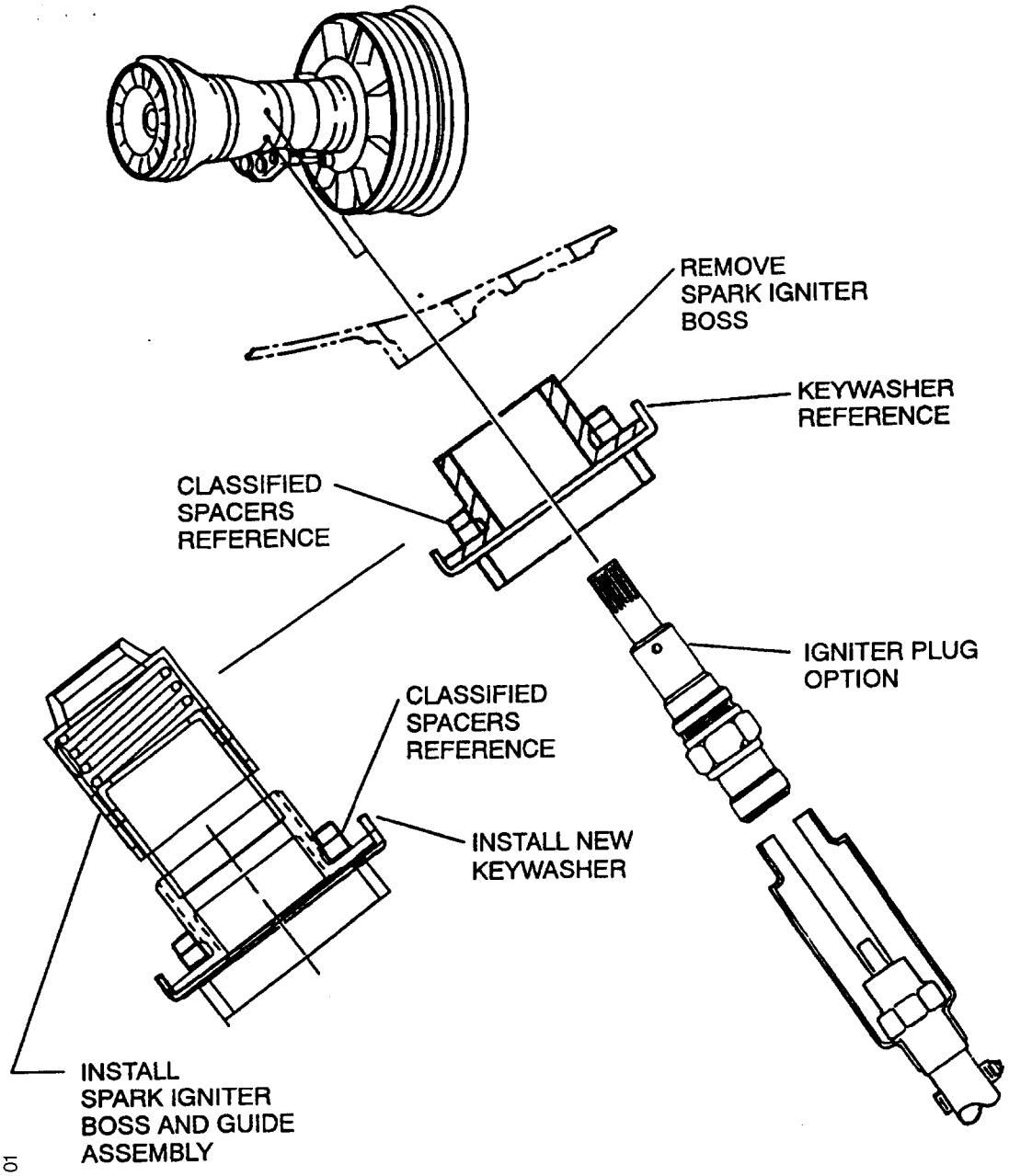
(d)If distance B is less than or equal to distance A, the igniter boss and guide assembly will not seal correctly when installed. If this occurs, it is recommended that the thickness of the spacers be decreased to make distance B greater than dimension A.

NOTE : This will result in igniter immersion more than what is specified in 74-21-02, P. Block 601 which may result in a reduced life of igniter plug. Plug should then be inspected for tip distress at each engine "A" check.

D. Close-Up

(1)Close thrust reverser and fan cowl doors. (Ref. 71-13-00, P. Block 301).

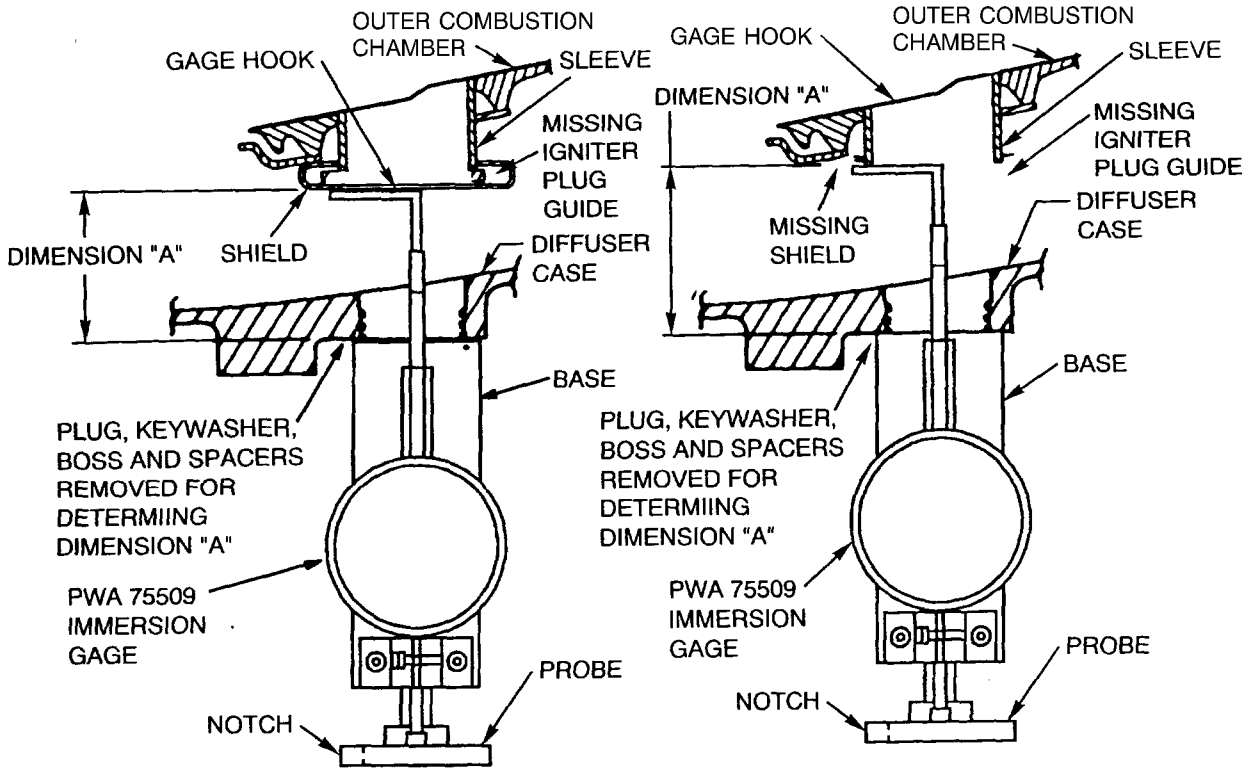
(2)Remove safety clips and tags and close circuit breakers.



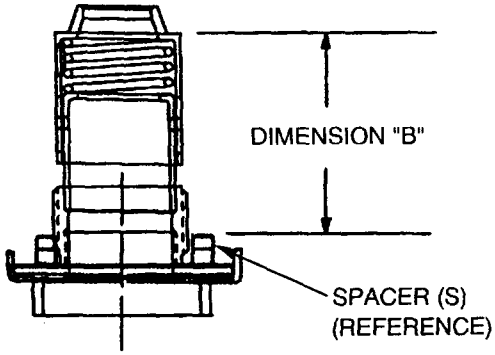
L-B8758 (1001)

BM5 74 00 00 8 KAM0 01

Location of Spark Igniter Boss
Figure 801



VIEWS SHOWING MISSING CHAMBER IGNITER GUIDE TYPES



IGNITER BOSS AND GUIDE ASSEMBLY
P/N 50JB55-01 CHECK (DIMENSION "B")

L-B8759 (1001)

BM5 74 00 00 8 KCM0 01

Igniter Boss and Guide Seal Check
Figure 802

ELECTRIC POWER SUPPLY - DESCRIPTION AND OPERATION

1. Description
(Ref. Fig. 001)

A normal 115 V/400 Hz busbar (202XP) is connected to START A position for engine 2 and 105XP system A engine 1 while an emergency 115 V/400 Hz busbar (403XP) is connected to START B position for both engines.
The electrical connections inside ENG panel are such that, in CONT RELIGHT position, both busbars are used for both engines (Ref. 74-30-00).
In order to avoid any inadvertent discharge during maintenance work, the HP fuel shut off valve activated electrical switch must be open to prevent any electrical power from reaching the ignition exciter.

2. Component Location
(Ref. Fig. 002)

FIN	FUNCTIONAL DESIGNATION	PANEL	ZONE	ACCESS DOOR	ATA REF.
7KG	P/BSW - ENG START/START1	429VU	211		74-10-00
6KG	P/BSW - ENG START/START2	429VU	211		74-10-00
H7	EXCITER-IGNITION, A ENG1 (ENG2)		453	451AL	74-11-01
			463	461AL	
H8	EXCITER-IGNITION, B ENG1 (ENG2)		453	451AL	74-11-01
			463	461AL	
	PLUG-IGNITER, A ENG1 (ENG2)		453	451AL	74-21-02
			463	461AL	
	PLUG-IGNITER, B ENG1 (ENG2)		454	452AR	74-21-02
			464	462AR	
	CABLE-EXCITER-TO-IGNITER PLUG ENG1 (ENG2)		453	451AL	74-21-01
			463	461AL	
	CABLE-EXCITER-TO-IGNITER PLUG ENG1 (ENG2)		454	452AL	74-21-01
			464	462AL	

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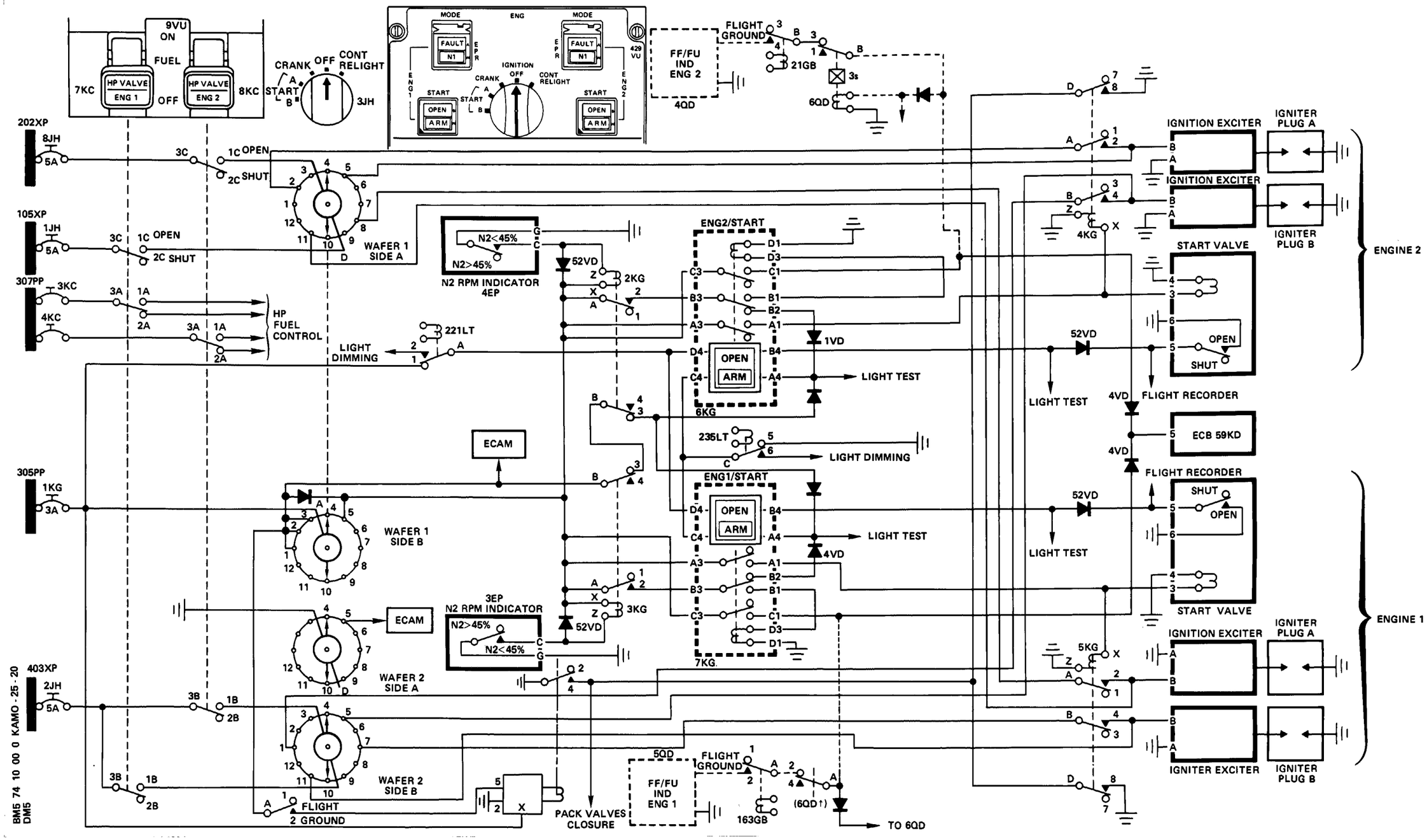
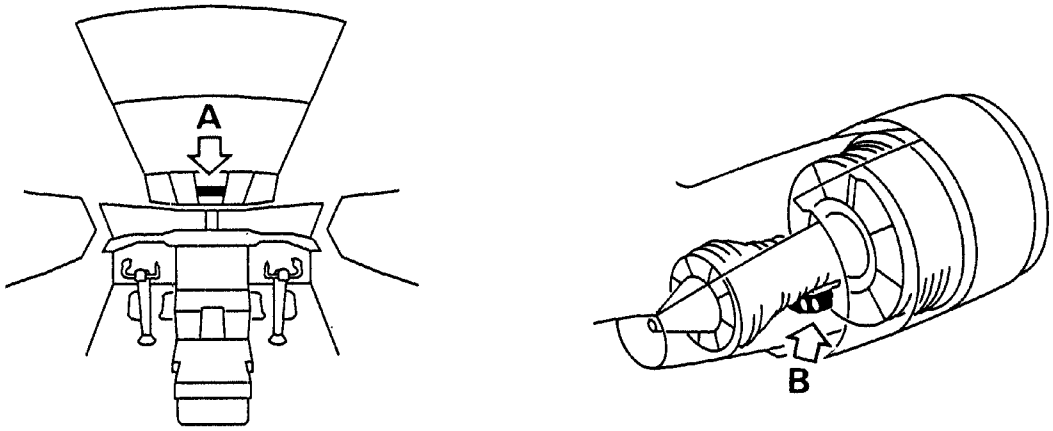
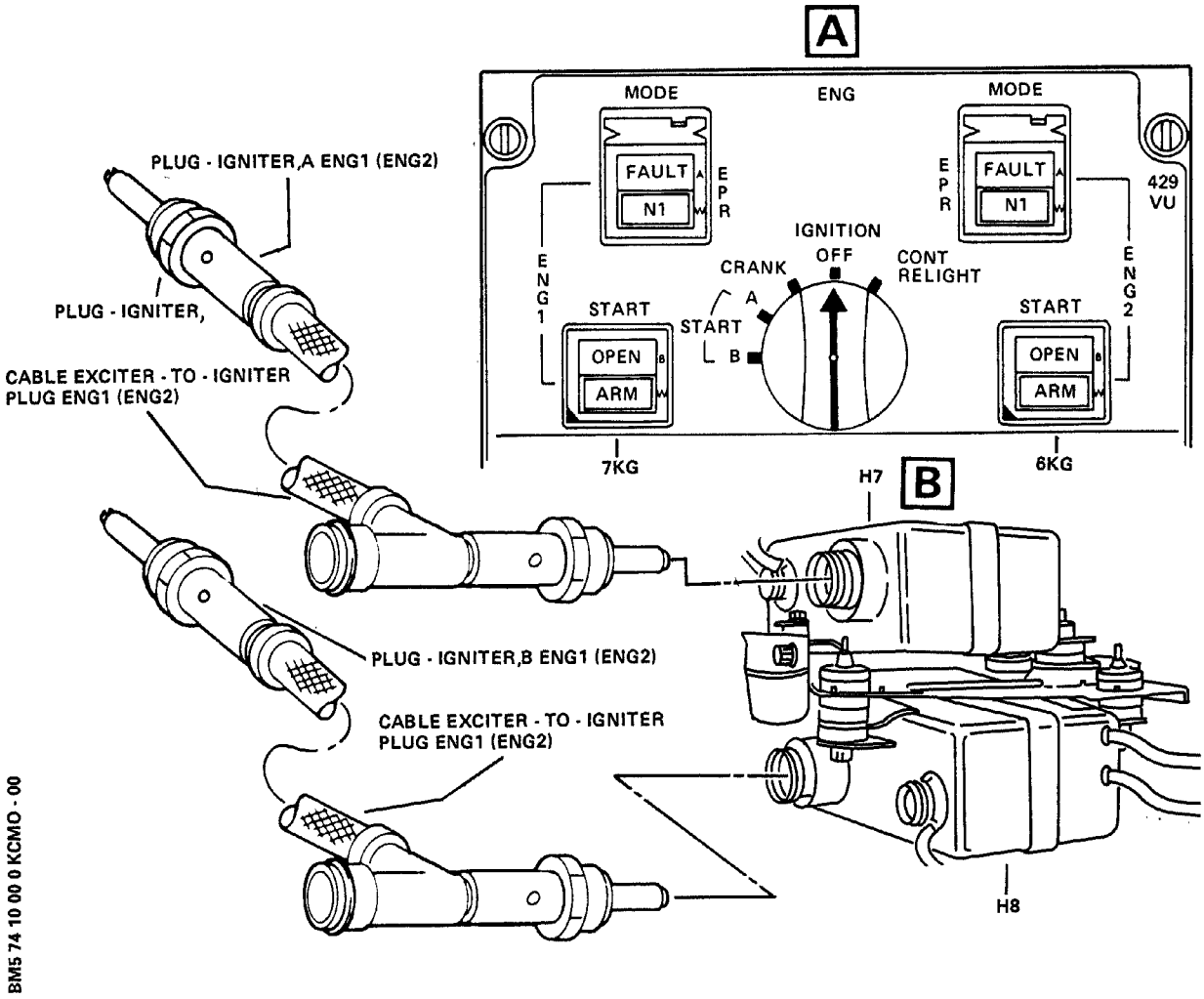


Ignition System
Figure 001





Electrical Power - Component Location
Figure 002

HIGH VOLTAGE SYSTEM - DESCRIPTION AND OPERATION

1. Description (Ref. Fig. 001)
   Ignition exciters are mounted together on the same bracket located on the upper right side of the gearbox.
   The ignition exciters are shrouded by a replacable cooling jacket and cooled by fan air.

2. Operation
   When selected, each ignition exciter receives a 115V/400Hz voltage which is filtered to prevent any high frequency feedback into the aircraft circuit.
   This voltage is then applied across the primary of a power transformer.
   The high voltage generated at the secondary of this transformer is rectified and applied across the storage capacitor, increasing the voltage and charge of this capacitor.
   When this voltage reaches the predetermined level for which the spark gap in the discharge tube has been calibrated, the gap breaks down. A portion of the charge flows through the primary of the high tension transformer and the trigger capacitor to ground. This current induces in the secondary a high enough voltage to ionize the air gap of the igniter plug.
   In case of igniter plug fault, the energy is dissipated through the bleeder resistor.
   WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH. IGNITION SWITCH MUST BE IN OFF POSITION AND THE SYSTEM INOPERATIVE FOR SEVERAL MINUTES BEFORE ANY MAINTENANCE OPERATION CAN BE STARTED (3 to 5 mn).

3. Charactistics

   A. Input voltage : 115V 400Hz AC (nominal)

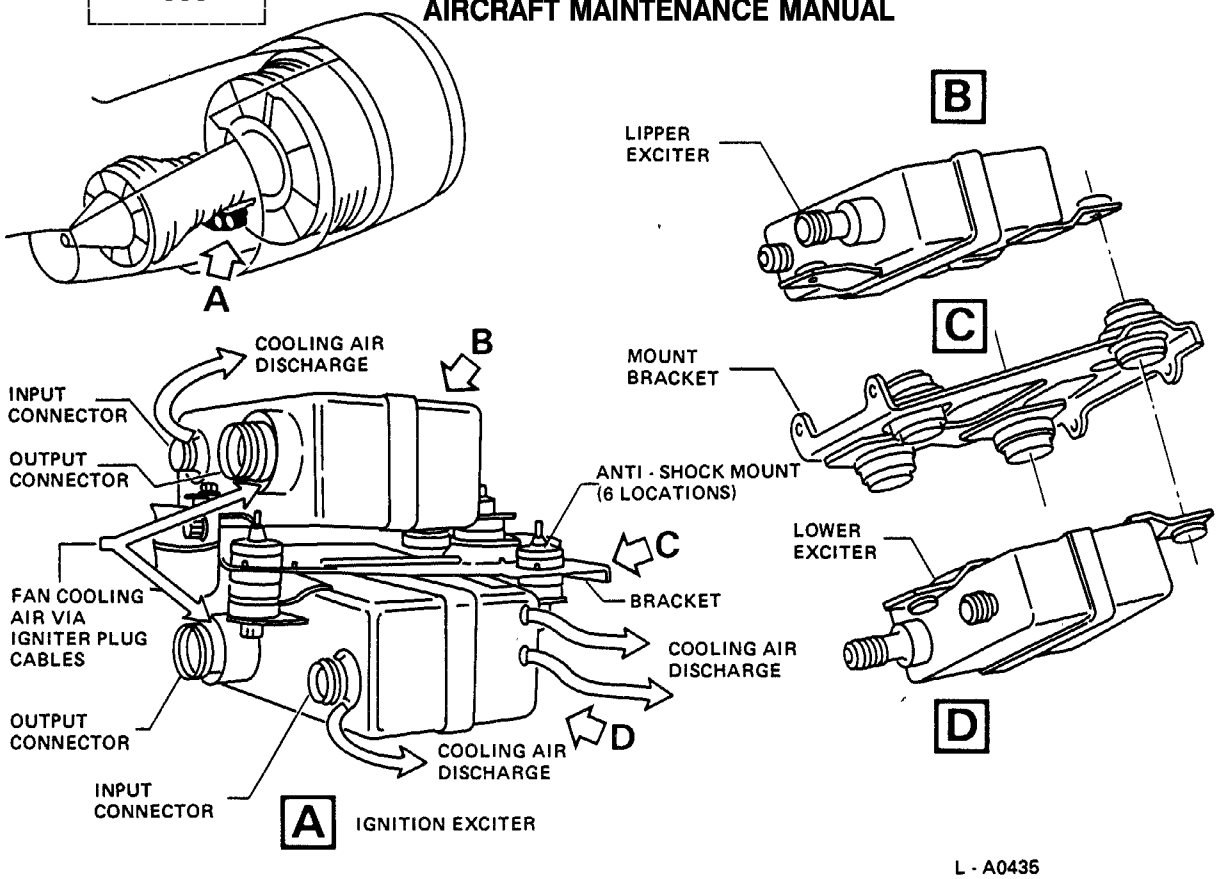
   B. Input current : 1.5 Amp. (maximum)

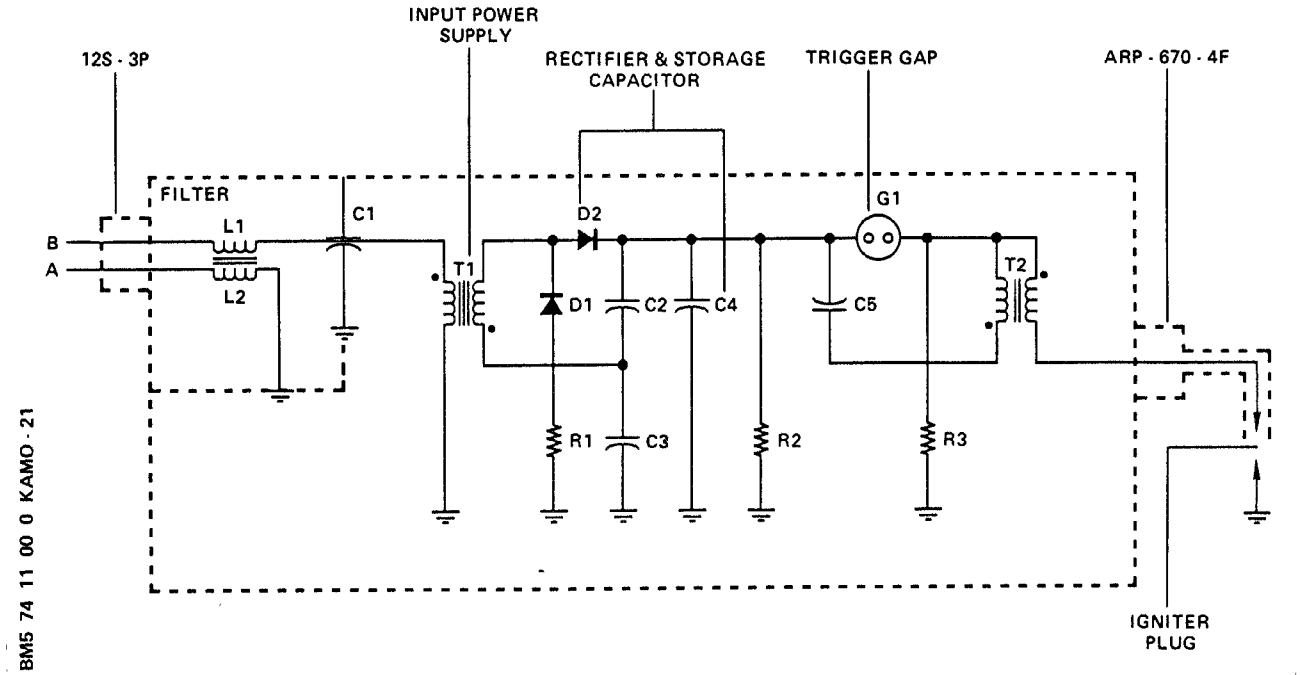
   C. Stored energy : 4 Joules (nominal)

   D. Spark rate : 1.0 to 2.5 per second

   E. Ionizing voltage : 22 to 26KV

   F. Operating altitude : up to 50000 ft
      NOTE : If needed, the exciter is capable of continuous operation, however to preserve exciter and igniter life, use only during take off, landing and foul weather.





Exciter Box
Figure 001

IGNITION EXCITER - REMOVAL/INSTALLATION

NOTE : The procedure is identical for each engine.

WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH. IGNITION SWITCH MUST BE IN OFF POSITION BEFORE REMOVAL OF ANY IGNITION COMPONENTS. ALLOW SEVERAL MINUTES TO ELAPSE BETWEEN OPERATION OF THE IGNITION SYSTEM AND THE REMOVAL OF COMPONENTS. UPON DETACHING THE CABLE FROM THE IGNITER PLUG, DISCHARGE THE CURRENT BY GROUNDING THE CABLE TERMINAL TO ENSURE COMPLETE DISSIPATION OF ENERGY FROM THE SYSTEM. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN SEVERE INJURY TO PERSONNEL.

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Torque Wrench
C.	Protective Closures
D.	Grommet
E.	Seal
F. Material No.P03-001	Oils (Ref. 70-00-00)
G. Material No.P06-009	Lubricants (Ref. 70-00-00)
H. Material No.P06-021	Lubricants (Ref. 70-00-00)
I. Material No.P06-036	Lubricants (Ref. 70-00-00)

Referenced Procedures

- 70-00-00, P. Block 201	Engine - Standard Practices
- 71-00-00, P. Block 501	Power Plant - General
- 71-13-00, P. Block 301	Cowl Doors
- 74-21-01, P. Block 401	Exciter-To-Igniter Plug Cable

2. Procedure

A. Job Set-Up

(1)Open, safety and tag circuit breakers for the appropriate engine, and open right fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

B. Removal

(1)Lower ignition exciter (Ref. Fig. 402, 401)

(a)Loosen clamp securing cooling hose to exciter. Disconnect hose and cap with protective cover.

(b)Remove the bolt and nut that attaches a clamp on the Power igniter cable to a bracket located between the upper and lower igniter cables.

(c)Loosen the clamp that attaches the heat shield segments at the igniter plug end of the cable. Remove heat shields from cable.

(d)Loosen the clamp that attaches the heat shield segments at the exciter end of the cable. Remove heat shields from cable.

(e)Loosen the cable coupling nut from the lower exciter at the inboard connector.

The coupling nut should only be sufficiently loose to permit free movement of the cable, not removal of the cable.

CAUTION : REMOVE THE CABLE ENDS (LEADS) FROM THE IGNITER PLUG AND THE IGNITION EXCITER BY PULLING THE CABLE CONNECTOR IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

WARNING : FOR MORE PROTECTION FROM A DANGEROUS ELECTRICAL CHARGE, DISCONNECT THE COUPLING NUT FROM THE IGNITION PLUG AND TOUCH THE CABLE END TO THE IGNITER PLUG BODY SHIELD.

(f) Disconnect the cable coupling nut from the igniter plug and touch the cable end against the igniter plug casing (body) to decrease to zero any remaining electrical charge.
Remove the heat shield clamp from cable.

(g) Disconnect the coupling nut from the lower exciter at the inboard connector. Remove the heat shield clamps from the cable and remove the cable from the engine.

(h) Remove three bolts, washers and nuts securing exciter to mount bracket and remove exciter, entrapped in heat shields, from engine.

(i) Remove grommet from exciter-to-igniter plug cable and discard.

(j) Remove heat shields from exciter.

(k) Remove seal from exciter input (smaller) connector. Discard seal and install protective closures.

(2) Upper ignition exciter (Ref. Fig. 403, 401)

(a) Loosen clamp securing hose to exciter. Disconnect hose and cap with protective cover.

(b) Remove the bolt and nut that attach a clamp on the upper igniter cable to a bracket located between the upper and lower igniter cables.

(c) Loosen the clamp that attaches the heat shield segments at the igniter plug end of the cable. Remove heat shields from cable.

(d) (Post SB PW4ENG 73-192) Loosen the clamps that attach the cooling hoses to the heat shield at the exciter end of the cable. Remove cooling hoses from the heat shield.

NOTE : Pre SB PW4ENG 73-192 engines do not have W5/W6 wiring harness connector cooling.

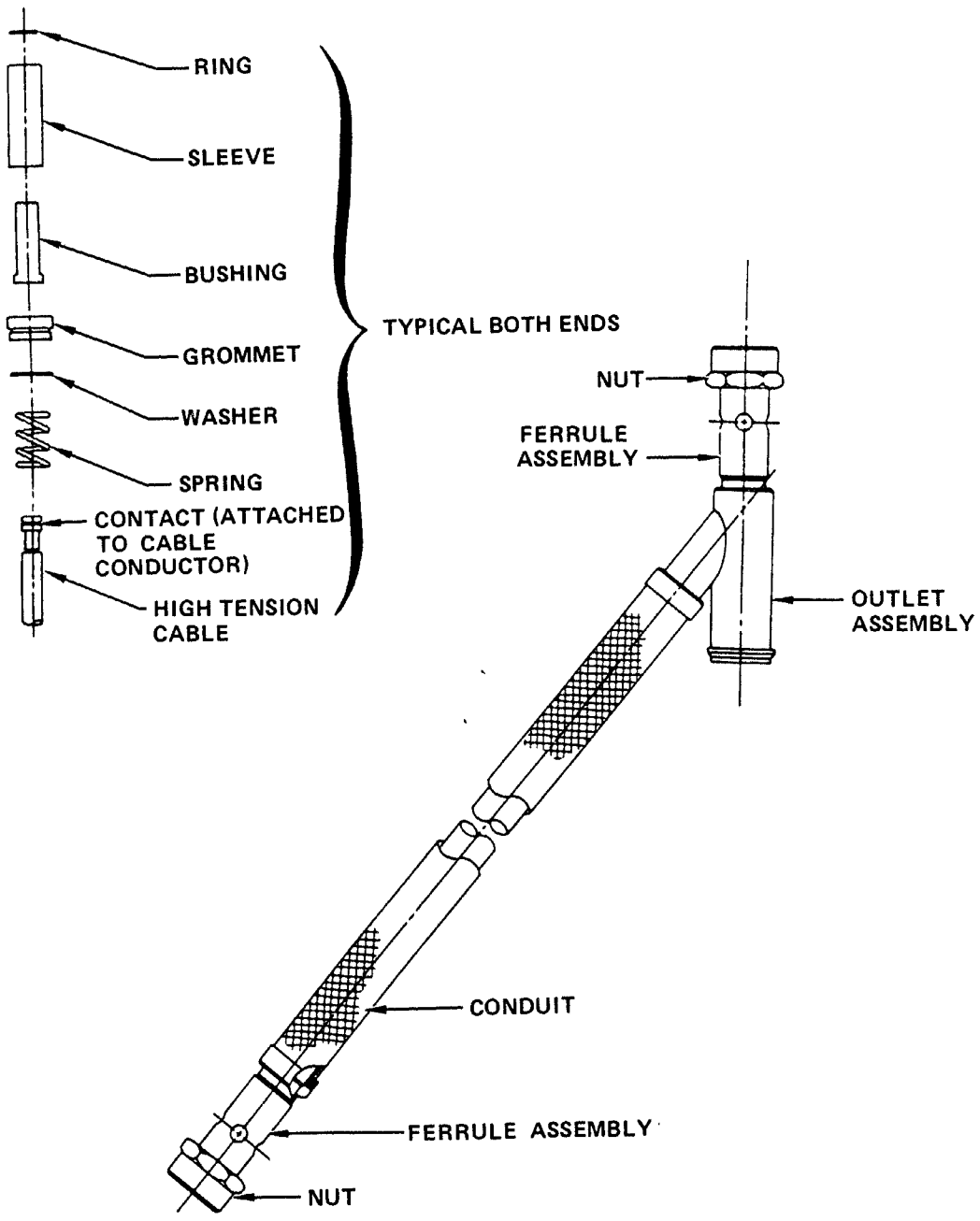
(e) Loosen the clamps that attach the heat shield segments at the exciter end of the cable. Remove heat shields from cable.

(f) Loosen the cable coupling nut from the upper exciter at the outboard connector.
The coupling nut should only be sufficiently loose to permit free movement of the cable, not removal of the cable.

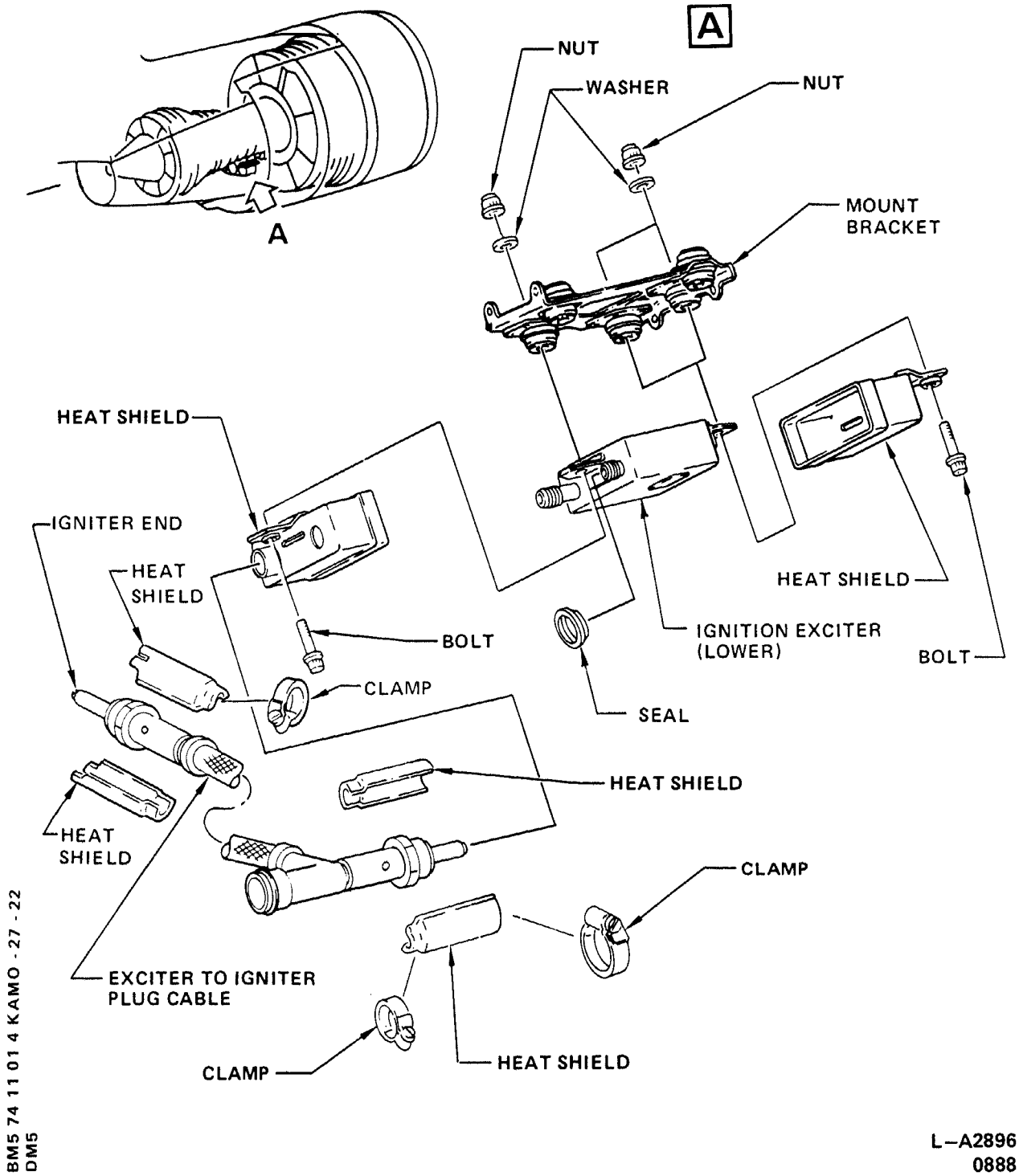
CAUTION : REMOVE THE CABLE ENDS (LEADS) FROM THE IGNITER PLUG AND THE IGNITION EXCITER BY PULLING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

WARNING : FOR MORE PROTECTION FROM A DANGEROUS ELECTRICAL CHARGE, DISCONNECT THE COUPLING NUT FROM THE IGNITION PLUG AND TOUCH THE CABLE END TO THE IGNITER PLUG BODY SHIELD.

(g) Disconnect the cable coupling nut from the igniter plug and touch the cable end against the igniter plug casing (body) to decrease to zero any remaining electrical charge.
Remove the heat shield clamp from cable.



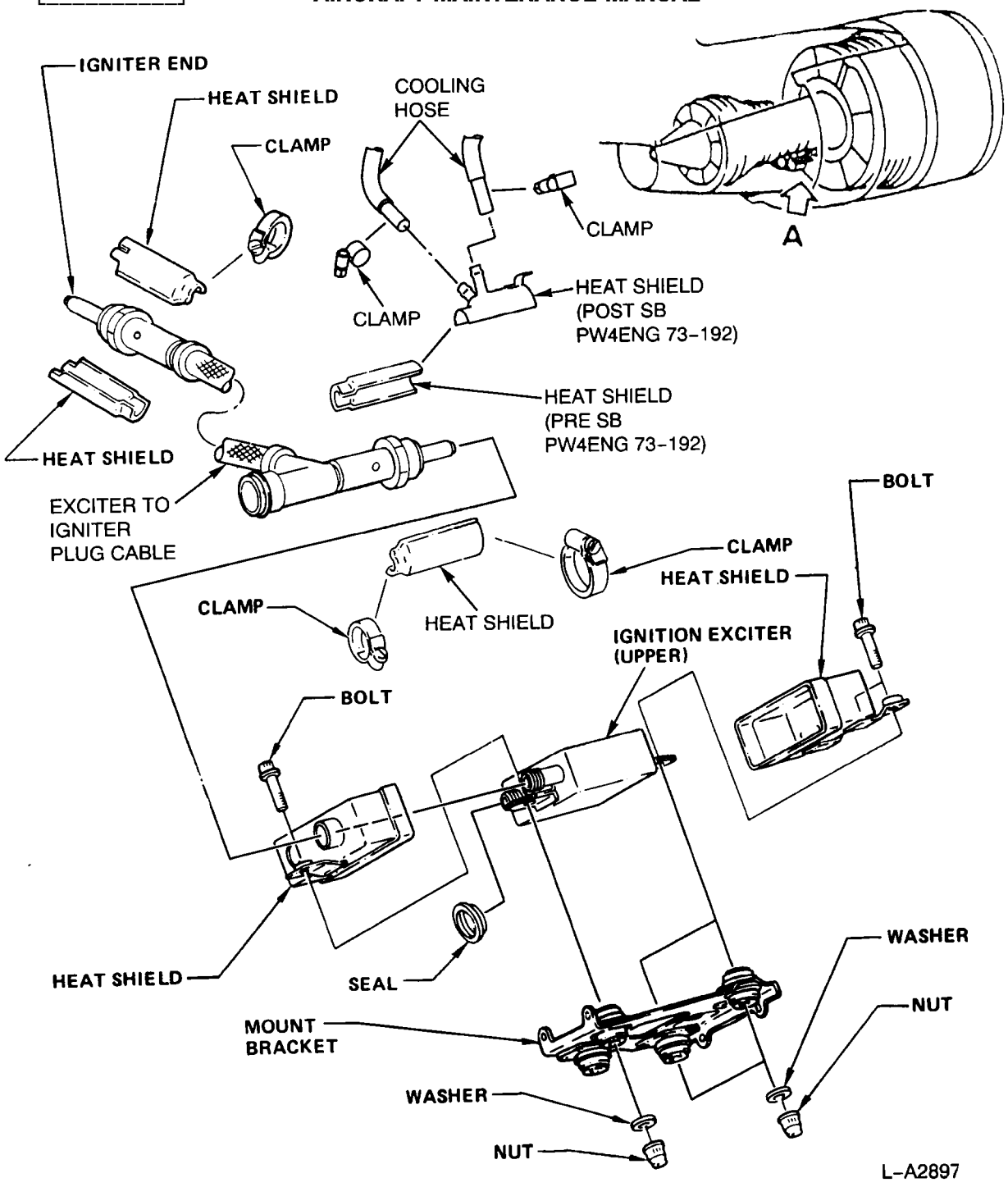
Exciter-To-Igniter Plug Cable
Figure 401



Ignition Exciter (Lower)
Figure 402

(h)Disconnect the coupling nut from the upper exciter at the outboard connector. Remove the heat shield clamps from the cable and remove the cable from the engine.
(i)Remove three bolts, washers and nuts securing exciter to mount bracket and remove exciter, entrapped in heat shields, from engine.
(k)Remove grommet from exciter-to-igniter plug cable and discard.
(l)Remove heat shields from exciter.
(m)Remove seal from exciter input (smaller) connector.
Discard seal and install protective closures.

C. Installation
(1)Lower ignition exciter (Ref. Fig. 402, 401)
(a)Remove protective closures from exciter.
Install seal (larger washer OD outboard) on exciter input (smaller) connector.
(b)Align rear exciter heat shield, with largest opening, with largest theaded connector on exciter. Engage front heat shield only for enough to line up mounting holes.
(c)Position lower ignition exciter, entrapped in heat shields, to mount bracket on right side of gearbox and secure in place with bolts, threads lubricated with Material No.P03-001, washers, and nuts. TORQUE bolts to between 36 and 40 lbf. in. (0.41 and 0.45 m.daN).
(d)Check cable contacts for evidence of arcing (discoloration and heavy pitting).
Check cable ends for evidence of carbon tracking. Replace cable if either condition is found. (Ref. 74-21-01, P. Block 401).
(e)Install new grommets on cable ends as follows :
1 Clean new grommets with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).
2 Slide grommets on cable.
(f)Place two clamps, small clamp first, over exciter end of cable.
(g)Install a clamp on the igniter plug end of the cable.
CAUTION : INSTALL THE CABLE ENDS (LEADS) TO THE IGNITER PLUG AND THE IGNITION EXCITER BY PUSHING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT.
IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.
(h)Lubricate the threads of the coupling nut at the igniter plug end of the cable with Material No.P06-009 and connect to the igniter plug. Keep the coupling nut sufficiently loose to permit free movement of the cable.
(i)Lubricate the threads of the coupling nut at the exciter end of the cable with Material No.P06-036 and connect the cable to the output connector on the exciter.
NOTE : When Material No.P06-036 is not available, an alternative lubricant (Material No.P06-021) can be used. Do not apply an excessive amount of lubricant to the cable coupling nut threads.
(j)TORQUE the coupling nuts on the cable until the nuts touch (bottom) on the shoulders of nuts. This TORQUE is usually between 140 and 160 lbf.in. (1.581 and 1.807 m.daN).
NOTE : Insufficient torque on cable nut can cause ignition-radiated



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Ignition Exciter (Upper)
Figure 403

noise to be picked up by aircraft radio equipment.

(k)Position heat shield segments over exciter end of cable and secure with clamps. TORQUE clamp screws to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(l)Install heat shields at igniter plug. Bend tabs of igniter plug heat shield into groove in boss before securing clamp. Secure with clamp. TORQUE clamp screw to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(m)Install the bolt, threads lubricated with Material No.P03-001 and nut that attaches a clamp on the lower igniter cable to a bracket located between the upper and lower igniter cable. TORQUE the bolt to between 36 and 40 lbf.in. (0.406 and 0.457 m.daN).

(n)Attach electrical cable. After engaging key to slot, secure connector by handtightening knurled coupling ring until plug is fully engaged in receptacle and coupling ring cannot be further tightened by hand.

(o)Remove protective cover and connect cooling hose to exciter. Secure with clamps. TORQUE clamps to between 25 and 30 lbf.in. (0.28 and 0.34 m.daN).

(2)Upper ignition exciter (Ref. Fig. 403, 401)

(a)Remove protective closures from exciter.
Insteal seal (larger washer OD outboard) on exciter input (smaller) connector.

(b)Align rear exciter heat shield, with largest opening, with largest threaded connector on exciter. Engage front heat shield only for enough to line up mounting holes.

(c)Position ignition exciter, entrapped in heat shields, to mount bracket on right side of gearbox and secure in place with bolts, threads lubricated with Material No.P03-001, washers and nuts. TORQUE bolts to bet- 36 and 40 lbf.in. (0.41 and 0.45 m.daN).

(d)Check cable contacts for evidence of arcing (discoloration and heavy pitting).
Check cable ends for evidence of carbon tracking. Replace cable if either condition is found. (Ref. 74-21-01, P. Block 401).

(e)Install new grommets on cable ends as follows :

1 Clean new grommets with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).

2 Slide grommets on cable.

(f)Place two clamps, small clamps first, over exciter end of cable.

(g)Install a clamp on the igniter plug end of the cable.

CAUTION : INSTALL THE CABLE ENDS (LEADS) TO THE IGNITER PLUG AND THE IGNITION EXCITER BY PUSHING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

(h)Lubricate the threads of the coupling nut at the igniter plug end of the cable with Material No.P06-009 and connect to the igniter plug. Keep the coupling nut sufficiently loose to permit free movement of the cable.

(i)Lubricate the threads of the coupling nut at the exciter end of the cable with Material No.P06-036 and connect the cable to the output connector on the exciter.

NOTE : When Material No.P06-036 is not available, an alternative

lubricant (Material No.P06-021) can be used. Do not apply an excessive amount of lubricant to the cable coupling nut threads.

(j)TORQUE the coupling nuts on the cable until the nuts touch (bottom) on the shoulders of nuts. This TORQUE is usually between 140 and 160 lbf.in. (1.581 and 1.807 m.daN).

NOTE : Insufficient torque on cable nut can cause ignition-radiated noise to be picked up by aircraft radio equipment.

(k)(Pre SB PW4ENG 73-192) Position heat shield segments over exciter end of cable and secure with clamps. TORQUE clamp screws to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(l)(Post SB PW4ENG 73-192) Position heat shield segments over exciter end of cable. Make sure the segment half with hose fittings has the fittings pointed up. Secure segments with clamps. TORQUE clamp screws to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(m)(Post sb PW4ENG 73-192) Install cooling hoses on heat shield fittings and secure with clamps. TORQUE the hose clamps to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(n)Install heat shields at igniter plug. Bend tabs of igniter plug heat shield into groove in boss before securing clamp. Secure with clamp. TORQUE clamp screw to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(o)Install the bolt, threads lubricated with Material No.P03-001 and nut that attaches a clamp on the upper igniter cable to a bracket located between the upper and lower igniter cable. TORQUE the bolt to between 36 and 40 lbf.in. (0.467 and 0.451 m.daN).

(p)Attach electrical cable. After engaging key to slot, secure connector by handtightening knurled coupling ring until plug is fully engaged in receptacle and coupling ring cannot be further tightened by hand.

(q)Remove protective cover and connect cooling hose to exciter. Secure with clamps. TORQUE clamps to between 25 and 30 lbf.in. (0.28 and 0.34 m.daN).

D. Close-Up and Test

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(2)Close right thrust and fan cowl doors and remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

(3)Test engine per Test Reference Table (Ref. 71-00-00, P. Block 501).

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IGNITION EXCITER - INSPECTION/CHECK

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Thread Chasing Die 1.000 - 20 UNS - 3A
C.	Access Platform
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 74-11-01, P. Block 701	Ignition Exciter

2. Procedure

A. Job Set Up
(1) Open, safety and tag circuit breakers for the appropriate engine and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2) Install access platform.

B. Inspection
(1) Inspect input connector for bent or damaged pins. Bent pins may be straightened using needlenose pliers. Damaged pins will require overhaul.
(2) Inspect output receptacle well for damage or signs of arcing or flashover on contact button. Arcing is identified by pitting or discoloration on contact. Flashover is identified by carbon tracking. If any of these indications are evident, send exciter to overhaul facility. Minor arcing of the contact button can be repaired by resurfacing the button with a Cratex abrasive rod. (Ref. 74-11-01, P. Block 701).
(3) Inspect the threads of each outlet. Minor repair to threads can be made by chasing with proper die. If threads are damaged beyond minor repair, ignition exciter will require overhaul.
(4) Inspect case for cracks, dents or large abrasions.

C. Close-Up
(1) Make certain that working area is clear and clean of tools and miscellaneous items of equipment.
(2) Remove access platform.
(3) Close thrust reverser and fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

IGNITION EXCITER - CLEANING/PAINTING

1. Equipment and Materials

ITEM	DESIGNATION
A. Material No.P05-050	Special Materials (Ref. 70-00-00)

Referenced Procedures

- 70-00-00, P. Block 201	Engine - Standard Practices
- 74-11-01, P. Block 401	Ignition Exciter

2. Clean Ignition Exciter Contact Well

A. Remove ignition exciter (Ref. 74-11-01, P. Block 401).

B. Remove dirt or foreign matter from inside contact well with compressed air.
NOTE : Compressed air shall be maintained at 30 psig (2.07 bars) maximum discharge pressure. Dirt on contact surface will cause reduced output or arcing.
WARNING : USE CLEANING SOLVENT IN WELL VENTILATED AREA. AVOID CONTACT WITH SKIN.

C. Clean ignition exciter outlet contact well with long bristle nonmetallic brush moistened with cleaning solvent (Ref. 70-00-00, P. Block 201), SPOP 208. Dry with compressed air. Minor arcing of the contact button can be removed by resurfacing the button with an abrasive rod, Material No.P05-050, using a circular movement of the hand. Repeat above cleaning procedure.

D. Clean inner ceramic walls using circular felt bob, 1/2 in. (12.7 mm) in diameter and approximately 1 3/4 in. (32.45 mm) long, suitable for use with hand chuck. Moisten with cleaning solvent (Ref. 70-00-00, P. Block 201), SPOP 208, and clean using circular movement of hand. Dry with compressed air.

E. Clean end surface of ceramic at seat of grommet face using short bristle nonmetallic brush moistened with cleaning solvent (Ref. 70-00-00, P. Block 201), SPOP 208. Dry with compressed air.

F. Install ignition exciter (Ref. 74-11-01, P. Block 401).

IGNITION COOLING DUCT - REMOVAL/INSTALLATION

1. Equipment and Materials

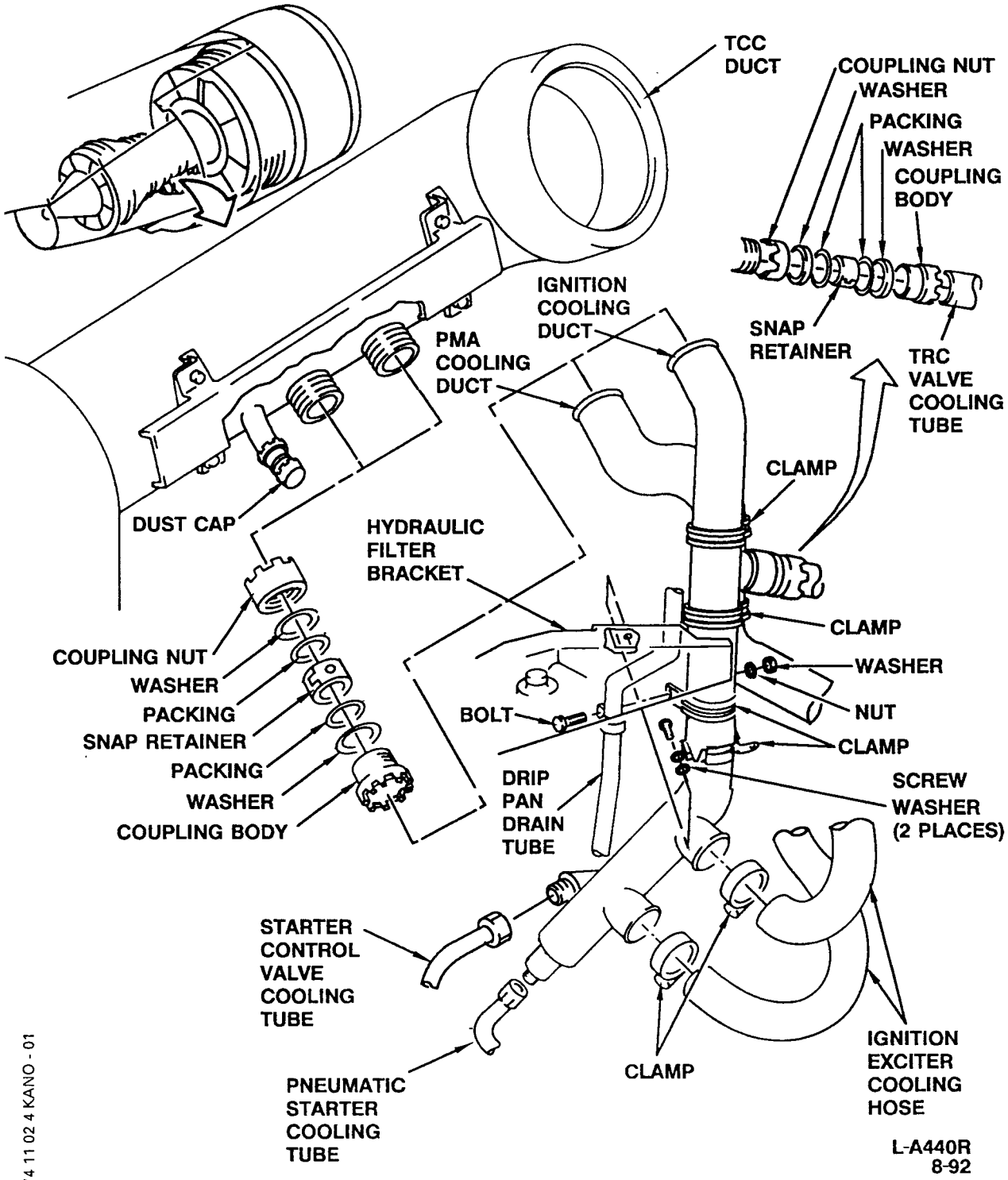
ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Protective Covers
C.	Packings
D.	Torque Wrench
E.	Corrosion Resistant Steel Lockwire (MS20995C32)(Ref. 70-00-00)
F. Material No.P06-002	Lubricants (Ref. 70-00-00)
Referenced Procedure - 71-13-00, P. Block 301	Cowl Doors

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the appropriate circuit breakers and open the right fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Removal (Post SB PW4NAC 75-9) (Ref. Fig. 401)
(1)Remove lockwire and remove coupling connecting ignition cooling duct to TCC duct. Install protective covers on open ports and discard packings.
(2)Remove clamps securing ignition exciter cooling hoses to duct and remove hoses. Install protective covers on hoses and duct.
(3)Remove pneumatic starter and starter control cooling tubes from duct. Install protective covers on tube and duct openings.
(4)Remove lockwire and then remove coupling connecting PMA cooling tube to TCC duct. Install protective covers on open ports and discard packings.
(5)Remove nuts, washers, bolts and clamps attaching PMA cooling duct to ignition cooling duct assembly.
(6)Remove nut, washer, bolt and clamp attaching duct to drip pan drain tube clamp assembly.
(7)Remove screws and washers attaching duct clamp and starter control wire bundle bracket to hydraulic filter bracket. Remove duct and clamp.

C. Installation (Post SB PW4NAC 75-9) (Ref. Fig. 401)
(1)Remove protective covers from top of ignition cooling duct and TCC duct.
(2)Lubricate packings with Material No.P06-002.
(3)Install coupling body on ignition cooling duct and coupling nut on TCC duct.
NOTE : Coupling consists of coupling body, coupling nut, two washers and snap retainer.
(4)Install washer and packing in coupling nut and washer and packing on



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Ignition Cooling Duct (Post SB PW4NAC 75-9)
Figure 401

coupling body using lubricated packings to retain washers.
(5)Secure TCC duct and ignition cooling duct together with snap retainer.
(6)Slide coupling body and coupling nut into position and engage threads. Do not torque at this step.
(7)Remove protective covers and connect pneumatic starter and starter control cooling tubes to duct. Fingertighten coupling nuts and do not torque at this step.
(8)Lubricate packings with Material No.P06-002.
(9)Install coupling body on PMA cooling tube and coupling nut on TCC duct.
NOTE : Coupling consists of coupling body, coupling nut, two washers and snap retainer.
(10)Install washers and packing in coupling nut and washer and packing on coupling body using lubricated packings to retain washers.
(11)Secure TCC duct and PMA cooling duct together with snap retainer.
(12)Slide body and nut into position and engage threads. Do not torque at this step.
(13)Place clamp on ignition cooling duct and attach clamp and starter control wire bundle bracket to hydraulic filter bracket with washers and screws.
Fingertighten screws and do not torque at this step.
(14)Attach ignition cooling duct to drip pan drain tube clamp assembly with clamp, bolt, washer and nut. TORQUE nut to between 32 and 36 lbf.in. (0.36 and 0.41 m.daN).
(15)TORQUE screws attaching ignition cooling duct to hydraulic filter bracket to between 75 and 85 lbf.in. (0.85 and 0.96 m.daN).
(16)TORQUE TCC duct and ignition cooling duct coupling to between 185 and 225 lbf.in. (2.10 and 2.54 m.daN).
(17)TORQUE TCC duct and PMA cooling tube duct coupling to between 65 and 80 lbf.in. (0.74 and 0.90 m.daN).
(18)Install two clamps with bolts, washers, and nuts to secure PWA cooling duct to ignition cooling duct assembly.
(19)TORQUE pneumatic starter and starter control cooling tube coupling nuts to between 450 and 500 lbf.in. (5.08 and 5.65 m.daN).
(20)Remove protective covers and attach ignition exciter cooling hoses to duct with clamps. TORQUE clamps to between 25 and 30 lbf.in. (0.28 and 0.34 m.daN).

D. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close right thrust reverser and fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

DISTRIBUTION - DESCRIPTION AND OPERATION

1. Description (Ref. Fig. 001, 002)

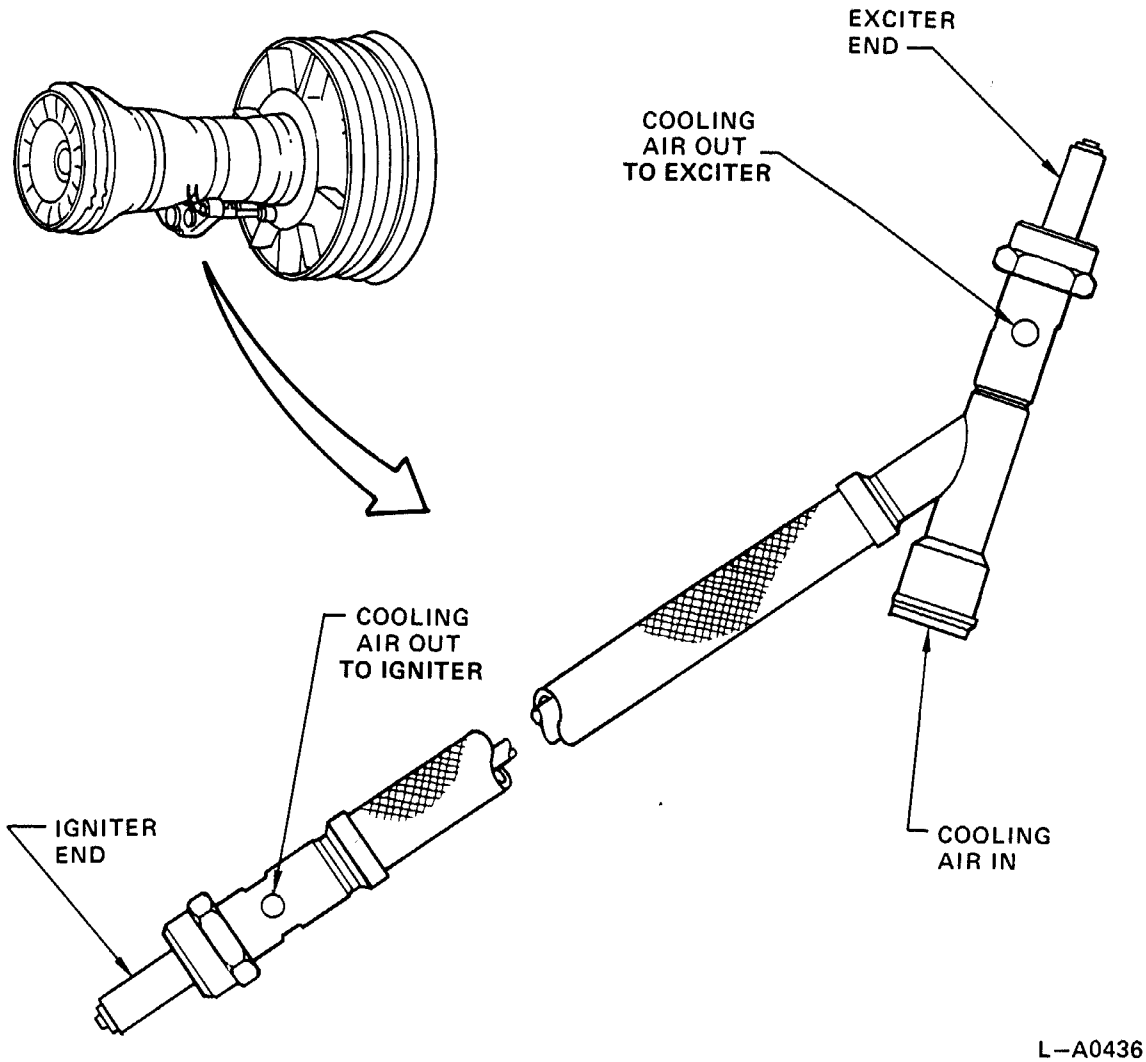
A. The exciter-to-igniter plug cable assembly consists of a high-tension lead enclosed in an aircooled flexible braided steel conduit. Ram air from the fan is directed through tubing and introduced to the cable at the exciter end. The enclosed high-tension lead carries electrical energy from the ignition exciter to the igniter plug. There are two cable assemblies on right side of the engine between the ignition exciters, located on upper right side gearbox to the igniter plugs located at the approximate 4 and 5 o'clock positions of the diffuser case.

WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH.
IGNITION SWITCH MUST BE IN OFF POSITION AND THE SYSTEM INOPERATIVE FOR SEVERAL MINUTES BEFORE ANY MAINTENANCE OPERATION CAN BE STARTED (3 TO 5 MN).

B. Igniter Plug

There are two igniter plugs, each one inserted at approximately the four and five o'clock locations in the combustion chamber. The igniter plugs pass through holes in the mid-section of the diffuser case aft of the fuel injectors.

The igniter plug provides a gap across which an electrical spark passes to ignite the fuel/air mixture. The igniter plug air gap becomes ionized by very high voltage (22-26 KV) provided by the ignition exciter. Once the air gap becomes ionized, current stored in the storage capacitor discharges across the gap. This discharge results in a high temperature plasma arc which is capable of igniting the fuel/air mixture within the combustion chamber.



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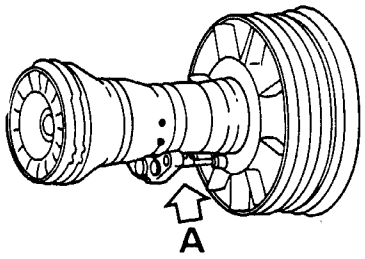
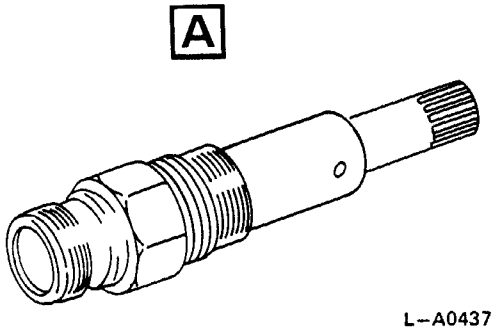
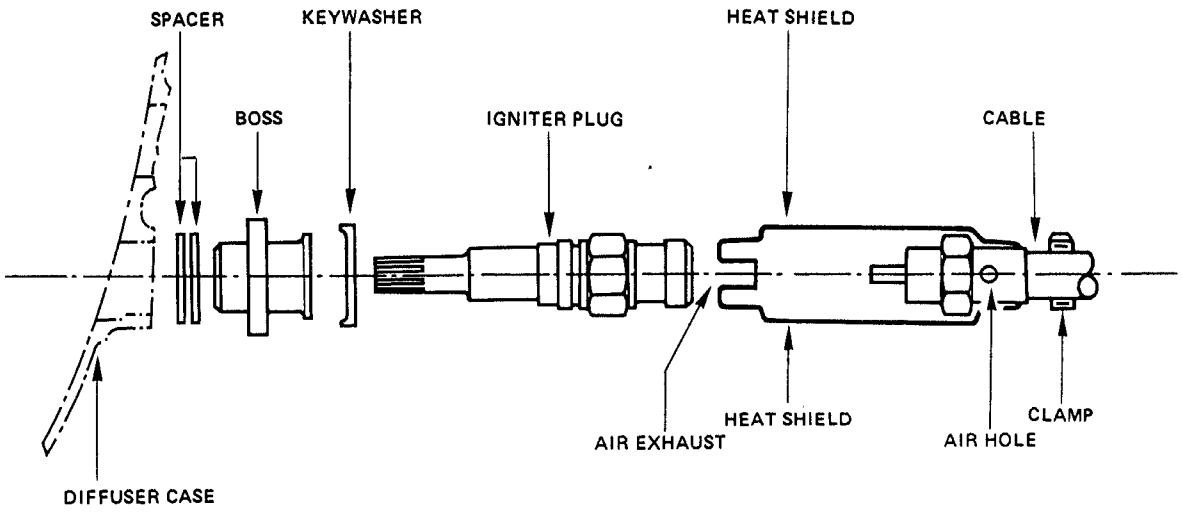
Exciter-To-Igniter Plug Lead
Figure 001







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Igniter Plug
Figure 002

EXCITER-TO-IGNITER PLUG CABLE - REMOVAL/INSTALLATION

WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH. IGNITION SWITCH MUST BE IN THE OFF POSITION BEFORE REMOVAL OF ANY IGNITION COMPONENTS. ALLOW SEVERAL MINUTES TO ELAPSE BETWEEN OPERATION OF THE IGNITION SYSTEM AND THE REMOVAL OF COMPONENTS. UPON DETACHING THE CABLE FROM THE IGNITER PLUG, DISCHARGE THE CURRENT BY GROUNDING THE CABLE TERMINAL TO ENSURE COMPLETE DISSIPATION OF ENERGY FROM THE SYSTEM. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN SEVERE INJURY TO PERSONNEL.

NOTE : This procedure is identical for each engine and exciter.

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Protective Caps
C.	Torque Wrench
D.	Sealing Washers
E.	Rubber Bushings
F. Material No.P03-001	Oils (Ref. 70-00-00)
G. Material No.P06-009	Lubricants (Ref. 70-00-00)
H. Material No.P06-021	Lubricants (Ref. 70-00-00)
I. Material No.P06-036	Lubricants (Ref. 70-00-00)
Referenced Procedures	
- 70-00-00, P. Block 201	Engine - Standard Practices
- 71-00-00, P. Block 501	Power Plant - General
- 71-13-00, P. Block 301	Cowl Doors
- 72-00-00, P. Block 201	Engine - General
- 74-21-01, P. Block 601	Exciter-To-Igniter Plug Cable

2. Procedure

A. Job Set-Up
(1) Open, safety and tag circuit breakers for the appropriate engine, and open right fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

B. Removal
(1) Exciter-to-igniter plug cable (upper plug - upper box) (Ref. Fig. 401, 402)
(a) Loosen clamp securing cooling hose to exciter. Disconnect hose and cap with protective cover.
(b) Remove the bolt and nut that attach a clamp on the upper igniter cable to a bracket located between the upper and lower igniter cables.
(c) (Post SB PW4ENG 73-192) Loosen the clamps that attach the cooling hoses to the heat shield at the exciter end of the cable. Remove cooling hoses from the heat shield.
NOTE : Pre SB PW4ENG 73-192 engines do not have W5/W6 wiring

harness connector cooling.

(d)Loosen the clamp that attaches the heat shield segments at the igniter plug end of the cable. Remove heat shields from cable.

(e)Loosen the clamps that attach the heat shield segments at the exciter end of the cable. Remove heat shields from cable.

(f)Loosen the cable coupling nut from the upper exciter at the outboard connector.
The coupling nut should only be sufficiently loose to permit free movement of the cable, not removal of the cable.

CAUTION : REMOVE THE CABLE ENDS (LEADS) FROM THE IGNITER PLUG AND THE IGNITION EXCITER BY PULLING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

WARNING : FOR MORE PROTECTION FROM A DANGEROUS ELECTRICAL CHARGE DISCONNECT THE COUPLING NUT FROM THE IGNITION PLUG AND TOUCH THE CABLE END TO THE IGNITER PLUG BODY SHIELD.

(g)Disconnect the cable coupling nut from the igniter plug and touch the cable end against the igniter plug casing (body) to decrease to zero any remaining electrical charge.
Remove the heat shield clamp from cable.

(h)Disconnect the coupling nut from the upper exciter at the outboard connector.
Remove the heat shield clamps from the cable and remove the cable from the engine.

(i)Remove grommet from exciter end and igniter end of cable. Discard grommets.

(j)After you remove the grommet and without any more disassembly, examine the high tension contacts, sleeves, and rubber bushings for any signs of arcing or flashover (Ref. 74-21-01, P. Block 601). Only if you see signs of arcing or flashing, replace the bushings, sleeves, or cable as necessary. See the installation procedure.

NOTE : The signs of arcing are discoloration and pitting.
The sign of flashover is carbon tracking (Ref. 74-21-01, P. Block 601).

(k)Install protective caps to coupling nuts on both ends of cable and on threaded output connnector on ignition exciter.

(2)Exciter-to-igniter plug cable (lower plug - lower box)
(Ref. Fig. 403, 402)

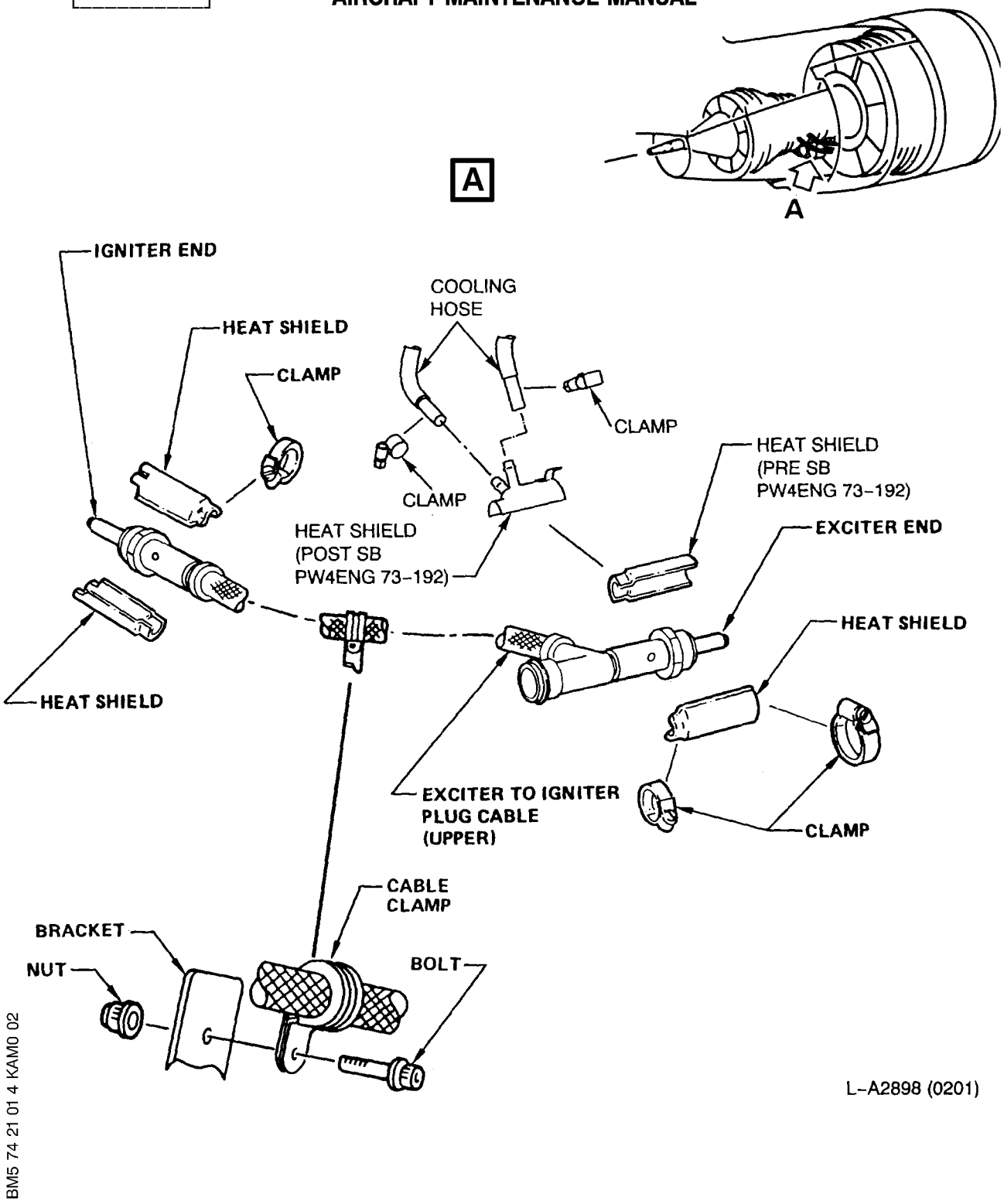
(a)Loosen clamp securing hose to exciter. Disconnect hose and cap with protective cover.

(b)Remove the bolt and nut that attaches a clamp on the lower igniter cable to a bracket located between the upper and lower igniter cables.

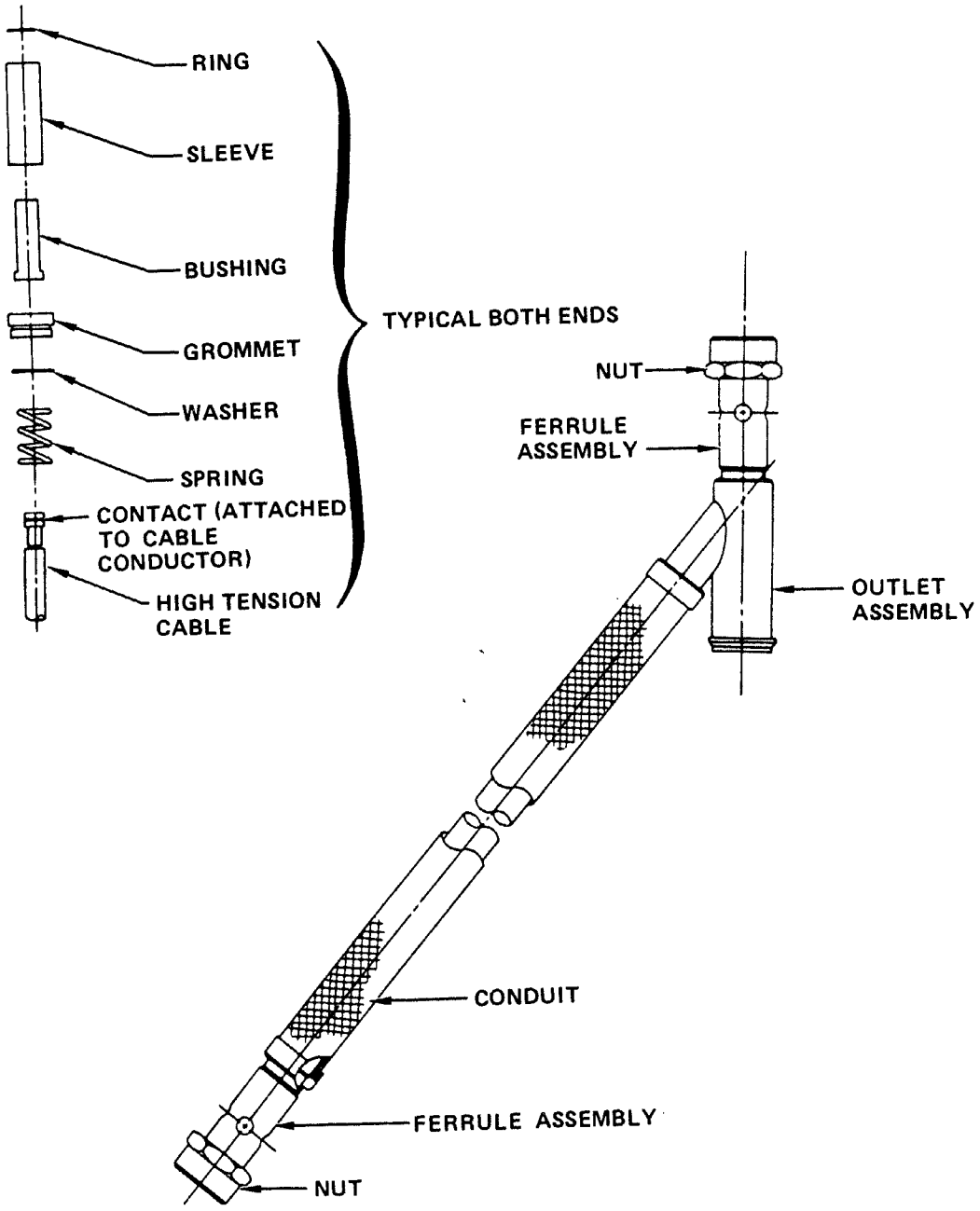
(c)Loosen the clamp that attaches the heat shield segments at the igniter plug end of the cable. Remove heat shields from cable.

(d)Loosen the clamps that attach the heat shield segments at the exciter end of the cable. Remove heat shields from cable.

(e)Loosen the cable coupling nut from the lower exciter at the inboard connector.
The coupling nut should only be sufficiently loose to permit free



Exciter-To-Igniter Plug Cables (Upper)
Figure 401



Exciter-To-Igniter Plug Cable
Figure 402

movement of the cable, not removal of the cable.

CAUTION : REMOVE THE CABLE ENDS (LEADS) FROM THE IGNITER PLUG AND THE IGNITION EXCITER BY PULLING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

WARNING : FOR MORE PROTECTION FROM A DANGEROUS ELECTRICAL CHARGE DISCONNECT THE COUPLING NUT FROM THE IGNITION PLUG AND TOUCH THE CABLE END TO THE IGNITER PLUG BODY SHIELD.

(f) Disconnect the cable coupling nut from the igniter plug and touch the cable end against the igniter plug casing (body) to decrease to zero any remaining electrical charge.
Remove the heat shield clamp from cable.

(g) Disconnect the coupling nut from the lower exciter at the inboard connector. Remove the heat shield clamps from the cable and remove the cable from the engine.

(h) Remove grommet from exciter end and igniter end of cable. Discard grommet.

(i) After you remove the grommet and without any more disassembly, examine the high tension contacts, sleeves, and rubber bushings for any signs of arcing or flashover (Ref. 74-21-01, P. Block 601). Only if you see signs of arcing or flashing, replace the bushings, sleeves, or cable as necessary. See the installation procedure.

NOTE : The signs of arcing are discoloration and pitting.
The sign of flashover is carbon tracking (Ref. 74-21-01, P. Block 601).

(j) Install protective caps to coupling nuts on both ends of cable and on threaded output connector on ignition exciter.

C. Installation

(1) Exciter-to-igniter plug cable (upper plug - upper box)
(Ref. Fig. 401, 402)

(a) Remove protective caps from each end of cable and from mating output connector on upper ignition exciter.

CAUTION : DO NOT TWIST EXCITER-TO-IGNITER PLUG CABLE WHEN TURNING CONNECTOR NUT, OR DAMAGE TO CABLE COULD RESULT.

(b) If new rubber bushings are to be installed comply with the following :

1 Clean bushings with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).

2 Slide treated rubber bushing with insulator on cable wire and secure in place with new retaining ring.

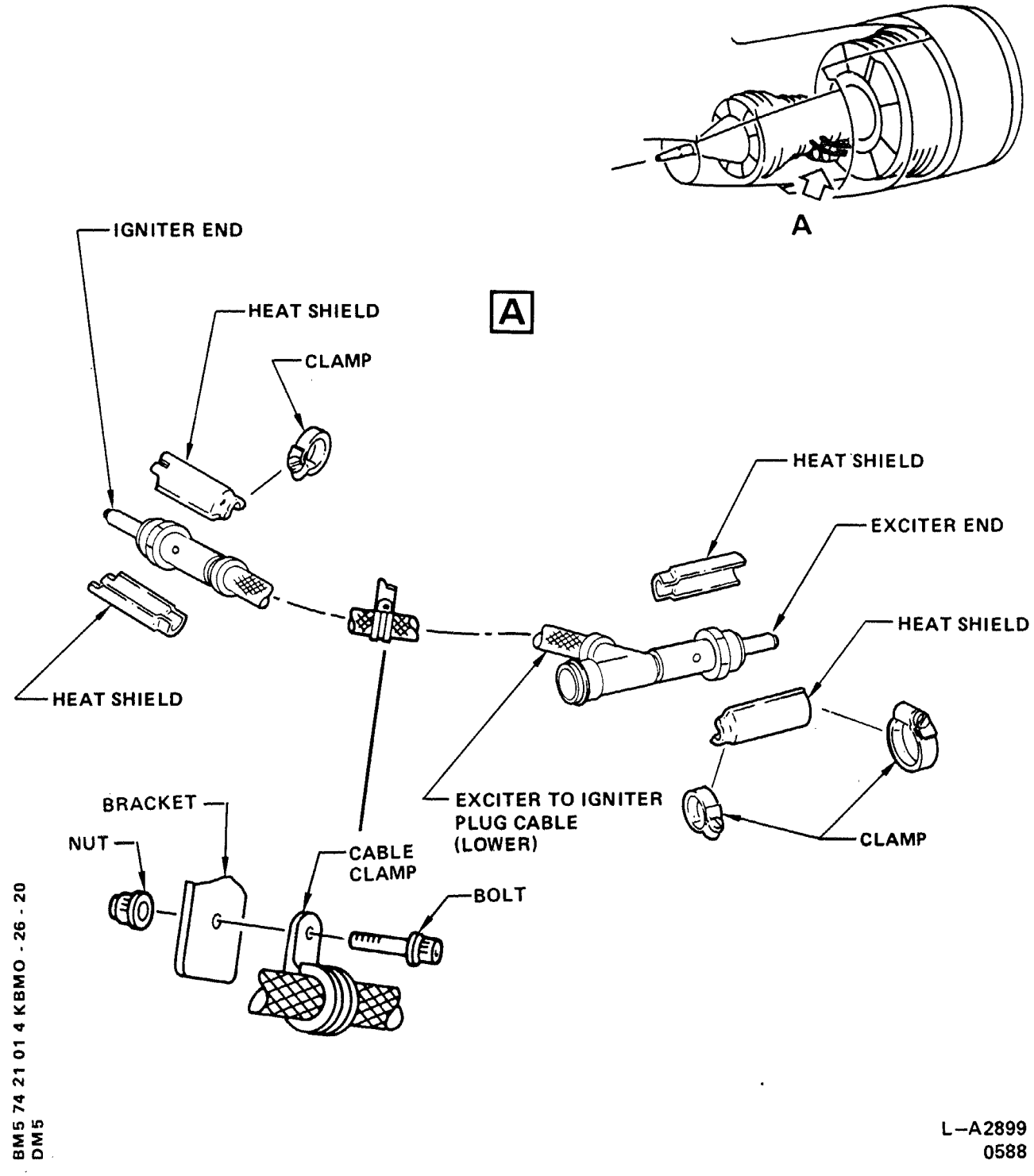
(c) Install new grommets on cable ends as follows :

NOTE : This step is not applicable to new cable assemblies with grommets previously installed.

1 Clean new grommets with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).

2 Slide grommets on cable.

(d) Place two clamps, smaller clamp first, over exciter end of cable.



Exciter-To-Igniter Plug Cables (Lower)
Figure 403

(e)Install a clamp on the igniter plug end of the cable.
CAUTION : INSTALL THE CABLE ENDS (LEADS) TO THE IGNITER PLUG AND THE IGNITION EXCITER BY PUSHING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT.
IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

(f)Lubricate the threads of the coupling nut at the igniter plug end of the cable with Material No.P06-009 and connect to the igniter plug. Keep the coupling nut sufficiently loose to permit free movement of the cable.

(g)Lubricate the threads of the coupling nut at the exciter end of the cable with Material No.P06-036 and connect the cable to the output connector on the exciter.
NOTE : When Material No.P06-036 is not available, an alternative lubricant (Material No.P06-021) can be used. Do not apply an excessive amount of lubricant to the cable coupling nut threads.

(h)TORQUE the coupling nuts on the cable until the nuts touch (bottom) on the shoulders of nuts. This torque is usually to between 140 and 160 lbf.in. (1.581 and 1.807 m.daN).
NOTE :Insufficient torque on cable nuts at exciter or igniter igniter end can cause ignition radiated noise to be picked up by aircraft radio equipment.

(i)Remove protective cover and connect cooling hose to exciter. Secure with clamps. TORQUE clamps to between 25 and 30 lbf.in. (0.28 and 0.34 m.daN).

(j)(Pre SB PW4ENG 73-192) Position heat shield segments over exciter end of cable and secure with clamps. TORQUE clamp screws to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(k)(Post SB PW4ENG 73-192) Position heat shield segments over the exciter end of the cable. Make sure the segment half with hose fittings has the fittings pointed up. Secure segments with clamps. TORQUE clamp screws to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(l)(Post SB PW4ENG 73-192) Install cooling hoses on heat shield fittings and secure with clamps. TORQUE the hose clamp to between 10 and 15 lbf.in. (0.11 and 0.17 m.daN).

(m)Install heat shields at igniter plug. Bend tabs of igniter plug heat shield into groove in boss before securing clamp. Secure with clamp. TORQUE clamp screw to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(n)Install cable clamp to upper cable. Lubricate bolt threads with material No. P03-001 and secure cable clamp to bracket with bolt and nut. TORQUE bolt to between 36 and 40 lbf.in. (0.40 and 0.45 m.daN).

(2)Exciter-to-igniter plug cable (lower plug - lower box)
(Ref. Fig. 403, 402)

(a)Remove protective caps from each end of cable and from mating output connector on lower ignition exciter.
CAUTION : DO NOT TWIST EXCITER-TO-IGNITER PLUG CABLE WHEN TURNING CONNECTOR NUT, OR DAMAGE TO CABLE COULD RESULT.

(b)If new rubber bushings are to be installed comply with the following :
1 Clean bushings with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).

2 Slide treated rubber bushing with sleeve on cable wire and secure in place with new retaining ring.

(c)Install new grommet on cable ends as follows :

NOTE : This step is not applicable to new cable assemblies with grommets previously installed.

1 Clean new grommet with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).

2 Slide grommets on cable.

(d)Place two clamps, smaller clamp first, over exciter end of cable.

(e)Install a clamp on the igniter plug end of the cable.

CAUTION : INSTALL THE CABLE ENDS (LEADS) TO THE IGNITER PLUG AND THE IGNITION EXCITER BY PUSHING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT.
IF LATERAL FORCE IS PERMITTED THE CABLE END CAN BE DAMAGED.

(f)Lubricate the threads of the coupling nut at the igniter plug end of the cable with Material No.P06-009 and connect to the igniter plug. Keep the coupling nut sufficiently loose to permit free movement of the cable.

(g)Lubricate the threads of the coupling nut at the exciter end of the cable with Material No.P06-036 and connect the cable to the output connector on the exciter.

NOTE : When Material No.P06-036 is not available, an alternative lubricant (Material No.P06-021) can be used. Do not apply an excessive amount of lubricant to the cable coupling nut threads.

(h)TORQUE the coupling nuts on the cable until the nuts touch (bottom) on the shoulders of nuts. This torque is usually to between 140 and 160 lbf.in. (1.581 and 1.807 m.daN).

NOTE : Insufficient torque on cable nuts at exciter or igniter end can cause ignition radiated noise to be picked up by aircraft radio equipment.

(i)Remove protective cover and connect cooling hose to exciter. Secure with clamps. TORQUE clamps to between 25 and 30 lbf.in. (0.28 and 0.34 m.daN).

(j)Position heat shield segments over exciter end of cable and secure with clamps. TORQUE clamp screws to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(k)Install heat shields at igniter plug. Bend tabs of igniter plug heat shield into groove in boss before securing clamp. Secure with clamp. TORQUE clamp screw to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).

(l)Install cable clamp to lower cable. Lubricate bolt threads with Material No.P03-001 and secure cable clamp to bracket with bolt and nut. TORQUE bolt to between 36 and 40 lbf.in. (0.40 and 0.45 m.daN).

D. Close-Up and Test

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(2)Close right thrust reverser and fan cowl doors, remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

(3)Test engine per Test Reference Table (Ref. 71-00-00, P. Block 501).

EXCITER-TO-IGNITER PLUG CABLE - INSPECTION/CHECK

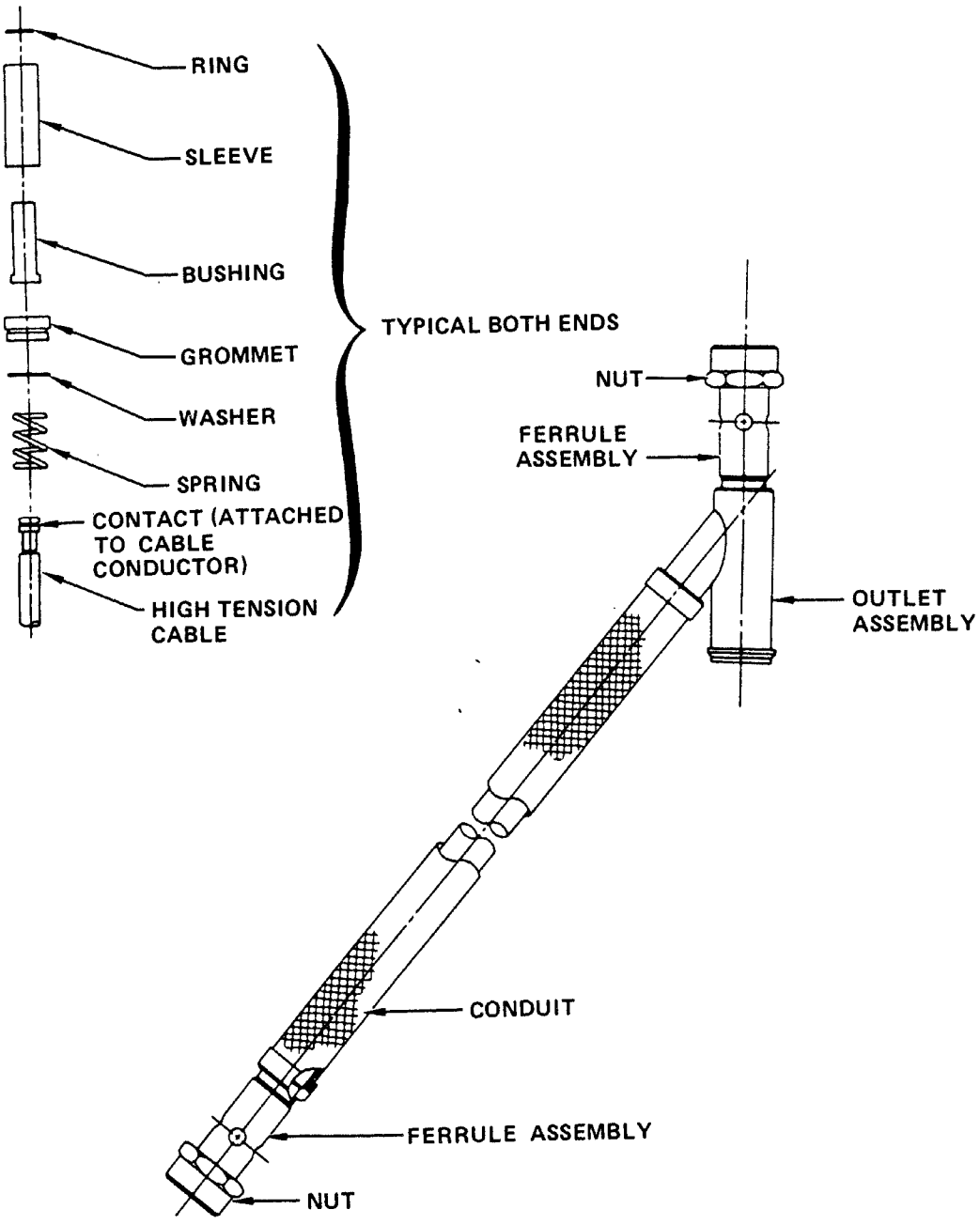
1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 74-21-01, P. Block 401	Exciter-To-Igniter Plug Cable
- 74-21-01, P. Block 701	Exciter-To-Igniter Plug Cable

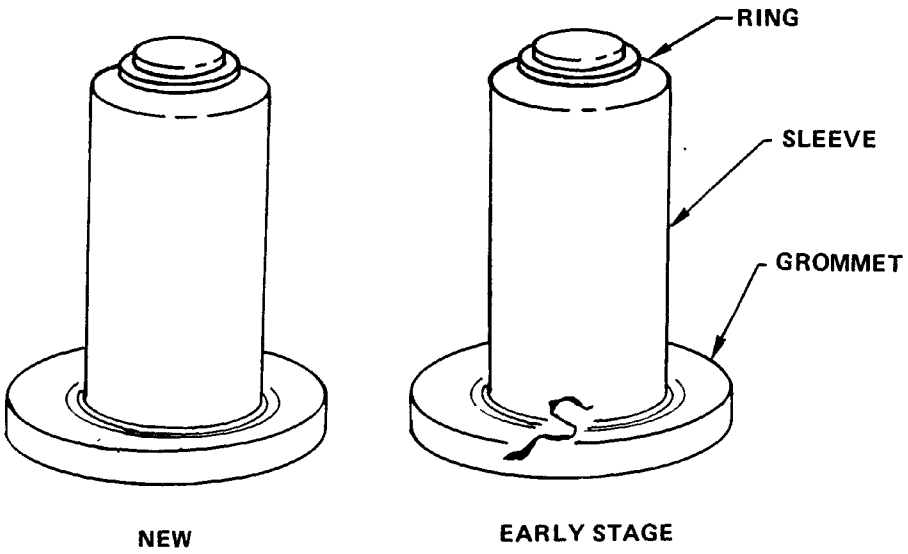
2. Procedure

A. Job Set-Up
(1) Open, safety and tag circuit breakers for the appropriate engine and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2) Remove exciter-to-igniter plug cable (Ref. 74-21-01, P. Block 401).

B. Inspection (Ref. Fig. 601, 602)
(1) General
Inspect conduit for cuts, abrasions, or other damage.
(2) Inspect high tension contact, sleeve, rubber bushing, and cable insulation (Ref. 74-21-01, P. Block 401).
CAUTION : DO NOT BEND OR PULL HIGH TENSION CABLE. INSULATION WILL BE DAMAGED.
During grommet replacement, inspect for evidence of arcing or flashover on high tension contact, sleeve, and rubber bushing. Arcing is identified by pitting and discoloration. Flashover is identified by carbon tracking. If major pitting of contact is evident, replace cable. Forward removed cable to appropriate facility for repair (Ref. Fig. 602). Minor discoloration and pitting of contact can be cleaned (Ref. 74-21-01, P. Block 701).
(a) If high tension sleeve shows carbon tracking, clean (Ref. 74-21-01, P. Block 701).
(b) If rubber bushing is hard, brittle, cracked, or shows evidence of carbon tracking, remove it (Ref. 74-21-01, P. Block 401).
Inspect high tension cable insulation.
1 If high tension cable insulation is hard, brittle, or cracked, replace cable. Forward removed cable to appropriate facility for repair.
2 If high tension cable is serviceable, replace rubber bushing (Ref. 74-21-01, P. Block 401).
(c) Inspect for presence of oil, dirt, or conductive contaminants on exposed parts. Clean cable (Ref. 74-21-01, P. Block 701).
(3) Inspect cable following rapid shut down. Whenever an engine is rapidly shut down, ignition system may not be sufficiently cooled. Inspect cables, particularly at igniter plug terminal, to ensure that excessive temperatures did not affect lead insulation or rubber bushings in a manner that may result in arcing, flashover and carbon tracking.



Exciter-To-Igniter Plug Cable
Figure 601



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Cable Ceramic Insulator Flashover Damage
Figure 602

C. Close-Up
(1)Install exciter to igniter plug cable (Ref. 74-21-01, P. Block 401).
(2)Make certain that working area is clean and clear of tools and miscellaneous item of equipment.
(3)Close thrust reverser and fan cowl doors. Remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).

EXCITER-TO-IGNITER PLUG CABLE - CLEANING/PAINTING

1. Equipment and Materials

ITEM	DESIGNATION
A. Material No.P05-017	Special Materials (Ref. 70-00-00)
B. Material No.P05-050	Special Materials (Ref. 70-00-00)

Referenced Procedures

- 70-00-00, P. Block 201	Engine - Standard Practices
- 74-21-01, P. Block 401	Exciter-to-igniter Plug Cable

2. Procedure

A. Clean Exciter-to-Igniter Plug Cable

(1)Remove exciter-to-igniter plug cable (Ref. 74-21-01, P. Block 401).

(2)Remove dirt or foreign matter from inside spring with compressed air.

NOTE : Compressed air shall be maintained at 30 psig (2.07 bars) maximum discharge pressure.

WARNING : USE CLEANING SOLVENT IN WELL VENTILATED AREA AVOID CONTACT WITH SKIN.

(3)Wipe high tension sleeve clean using clean lint-free cotton wipers Material No.P05-017, moistened with cleaning solvent (Ref. 70-00-00, P. Block 201), SPOP 208. Dry with compressed air.

(4)Wipe conduit assembly with clean lint-free cotton wipers, Material No.P05-017, moistened with cleaning solvent (Ref. 70-00-00, P. Block 201), SPOP 208.

(5)Dry with compressed air.

(6)Minor arcing and discoloration of contact button can be removed by resurfacing button with Material No.P05-050 using a circular hand motion.

(7)Clean high tension contact as required with clean lint free cotton wipers, Material No.P05-017 moistened with cleaning solvent (Ref. 70-00-00, P. Block 201), SPOP 208. Dry with compressed air.

(8)Install exciter-to-igniter plug cable (Ref. 74-21-01, P. Block 401).

IGNITER PLUG - REMOVAL/INSTALLATION

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Access Platform
C.	Protective Caps
D.	Key Washers
E.	Grommet
F.	Torque Wrench
G.	Corrosion Resistant Steel Lockwire (AS3214-02) (Ref. 70-00-00)
H. PWA24524	Tap - Chasing
I. PWA27641	Tap - Chasing
J. PWA75509	Gage, Immersion
K. Material No.P03-001	Oils (Ref. 70-00-00)
L. Material No.P06-023	Lubricants (Ref. 70-00-00)
M. Material No.P06-009	Lubricants (Ref. 70-00-00)
N. Material No.P06-021	Lubricants (Ref. 70-00-00)
O. Material No.P06-036	Lubricants (Ref. 70-00-00)
P. Material No.P11-027	Cleaning Agents (Ref. 70-00-00)
Referenced Procedures	
- 70-00-00, P. Block 201	Engine - Standard Practices
- 71-00-00, P. Block 501	Power Plant - General
- 71-13-00, P. Block 301	Cowl Doors
- 74-21-01, P. Block 401	Exciter-To-Igniter Plug Cable

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the circuit breakers and open right fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2)Install access platform.

B. Removal
(1)Igniter plug (Procedure A) (Ref. Fig. 401)
NOTE : This procedure applies to both igniter plug locations and is used only for removal and installation (replacement) of igniter plug and/or key washer. If boss and/or spacers are to be replaced see procedure B.
WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH. IGNITION SWITCH MUST BE IN THE OFF POSITION BEFORE REMOVAL OF ANY IGNITION COMPONENTS.
ALLOW SEVERAL MINUTES TO ELAPSE BETWEEN OPERATION OF THE IGNITION SYSTEM AND THE REMOVAL OF COMPONENTS. UPON DETACHING THE CABLE FROM THE IGNITER PLUG, DISCHARGE THE CURRENT BY GROUNDING THE CABLE TERMINAL TO ENSURE COMPLETE DISSIPATION OF ENERGY FROM THE SYSTEM. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN SEVERE INJURY TO PERSONNEL.

(a)Remove the bolt and nut that attach a clamp on the exciter-to-igniter cable (the upper or lower cable as necessary) to a bracket located between the upper and lower igniter cables.
(b)Loosen the clamp that attaches the heat shield segments at the igniter plug end of the cable. Remove the heat shields from the cable.
(c)Loosen the clamps that attach the heat shield segments at the exciter end of the cable. Remove the heat shields from the cable.
(d)Loosen the cable coupling nut from the connector on the exciter. The coupling nut should only be loose sufficiently to permit free movement of the cable, not removal of the cable.

CAUTION : REMOVE THE CABLE ENDS (LEADS) FROM THE IGNITER PLUG AND THE IGNITION EXCITER BY PULLING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT.
IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

WARNING : FOR MORE PROTECTION FROM A DANGEROUS ELECTRICAL CHARGE, DISCONNECT THE COUPLING NUT FROM THE IGNITION PLUG AND TOUCH THE CABLE END TO THE IGNITER PLUG BODY SHIELD.

(e)Disconnect the cable coupling nut from the igniter plug and touch the cable end against the igniter plug casing (body) to decrease to zero any remaining electrical charge. Remove the heat shield clamp from the cable.
(f)Disconnect the coupling nut from the connector on the exciter (upper or lower exciter as necessary). Remove the heat shield clamps from the cable and remove the cable from the engine.
(g)Remove grommet from exciter-to-igniter plug cable and discard.
(h)Install protective cap on cable end and the output connector on the exciter.
(i)Loosen igniter plug while keeping igniter plug boss from turning. Do not remove lockwire from boss.
(j)Remove igniter plug.
(k)If key washer is damaged or worn, unbend tabs, remove and discard key washer.

(2)Igniter plug boss (Procedure B) (Ref. Fig. 402) (Sheet 1/2)

WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH. IGNITION SWITCH MUST BE IN THE OFF POSITION BEFORE REMOVAL OF ANY IGNITION COMPONENTS. ALLOW SEVERAL MINUTES TO ELAPSE BETWEEN OPERATION OF THE IGNITION SYSTEM AND THE REMOVAL OF COMPONENTS. UPON DETACHING THE CABLE FROM THE IGNITER PLUG, DISCHARGE.
THE CURRENT BY GROUNDING THE CABLE TERMINAL TO ENSURE COMPLETE DISSIPATION OF ENERGY FROM THE SYSTEM.
FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN SEVERE INJURY TO PERSONNEL.

(a)Remove the bolt and nut that attach a clamp on the exciter-to-ignitor cable (the upper or lower cable as necessary) to a bracket located between the upper and lower igniter cables.
(b)Loosen the clamp that attaches the heat shield segments at the igniter plug end of the cable. Remove the heat shields from the cable.
(c)Loosen the clamps that attach the heat shield segments at the exciter end of the cable. Remove the heat shields from the cable.
(d)Loosen the cable coupling nut from the connector on the exciter. The coupling nut should only be loose sufficiently to permit free movement

of the cable, not removal of the cable.

CAUTION : REMOVE THE CABLE ENDS (LEADS) FROM THE IGNITER PLUG AND THE IGNITION EXCITER BY PULLING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT.
IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

WARNING : FOR MORE PROTECTION FROM A DANGEROUS ELECTRICAL CHARGE, DISCONNECT THE COUPLING NUT FROM THE IGNITION PLUG AND TOUCH THE CABLE END TO THE IGNITER PLUG BODY SHIELD.

(e) Disconnect the cable coupling nut from the igniter plug and touch the cable end against the igniter plug casing (body) to decrease to zero any remaining electrical charge. Remove the heat shield clamp from the cable.

(f) Disconnect the coupling nut from the connector on the exciter (upper or lower exciter as necessary). Remove the heat shield clamps from the cable and remove the cable from the engine.

(g) Install protection covers on the cable ends and the connector on the exciter.

(h) Remove igniter plug from boss on diffuser case.

NOTE : Hold boss with wrench to prevent boss from turning while removing igniter.

(i) Remove lockwire, igniter boss, and spacers.

(j) If either boss or classified spacers are to be replaced, measure removed boss, spacers and key washer as indicated (Ref. Fig. 402), (Sheet 1/2) Dimension A.

NOTE : Measurement should be retained for reassembly thickness comparison and possible spacer thickness adjustment.

(k) If key washer is damaged, worn or will not provide an adaquate seal, remove and discard key washer.

R (3) Igniter plug boss (procedure c) (Ref. Fig. 402) (Sheet 2/2)

NOTE : This procedure applies to both igniter plug locations. If boss or spacer(s) are to be replaced, and parts removed at disassembly are not available, igniter plug immersion depth must be determined using this procedure. If none of the above parts are to be replaced, remove igniter plug (See procedure A).

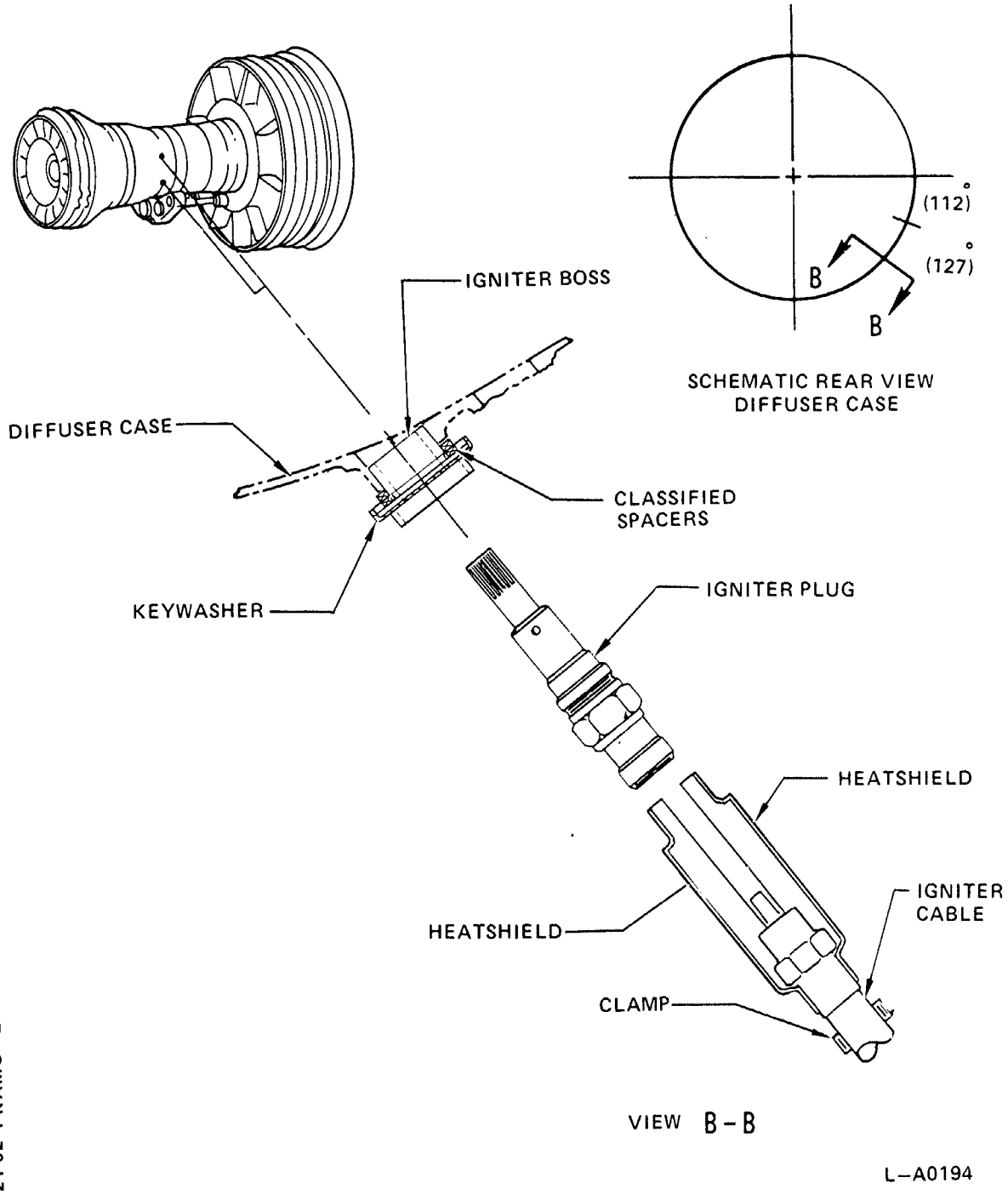
NOTE : If boss or spacer(s) are to be replaced, and parts removed at disassembly are available, check boss and spacer thickness (See procedure B).

WARNING : IGNITION SYSTEM VOLTAGE IS DANGEROUSLY HIGH. IGNITION SWITCH MUST BE IN THE OFF POSITION BEFORE REMOVAL OF ANY IGNITION COMPONENTS. ALLOW SEVERAL MINUTES TO ELAPSE BETWEEN OPERATION OF THE IGNITION SYSTEM AND THE REMOVAL OF COMPONENTS. UPON DETACHING THE CABLE FROM THE IGNITER PLUG, DISCHARGE THE CURRENT BY GROUNDING THE CABLE TERMINAL TO ENSURE COMPLETE DISSIPATION OF ENERGY FROM THE SYSTEM. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN SEVERE INJURY TO PERSONNEL.

(a) Remove the bolt and nut that attach a clamp on the exciter-to-igniter cable (the upper or lower cable as necessary) to a bracket located between the upper and lower igniter cables.

(b) Loosen the clamp (7) that attaches the heat shield segments (5) and (6) at the igniter plug (4) end of the cable (8). Remove the heat shields.

(c) Loosen the clamps that attach the heat shield segments at the exciter



Igniter Plug Replacement
Figure 401

end of the cable. Remove the heat shields.

(d)Loosen the cable coupling nut from the output connector on the exciter. The coupling nut should only be loose sufficiently to permit free movement of the cable, not removal of the cable.

CAUTION : REMOVE THE CABLE ENDS (LEADS) FROM THE IGNITER PLUG AND THE IGNITION EXCITER BY PULLING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

(e)Disconnect the cable coupling nut from the igniter plug (4) and touch the cable end against the igniter plug casing (body) to decrease to zero any remaining electrical charge. Remove the heat shield clamp from the cable.

(f)Disconnect the coupling nut from the output connector on the exciter (upper or lower exciter as necessary). Remove the heat shield clamps from the cable and remove the cable (8) from the engine.

(g)Remove grommet from plug end of cable and discard.

(h)Install protective closure on cable end and the connector on the exciter.

(i)Remove plug from its boss (2) on diffuser case.

NOTE : Hold boss with wrench to prevent boss from turning while removing plug.

(j)Unbend tabs on key washer (3). Remove and discard key washer.

(k)Remove lockwire, boss and spacer(s) (1) from diffuser case.

C. Installation

(1)Igniter plug (prodecure A) (Ref. Fig. 401)

NOTE : This procedure applies to either igniter plug and is used only for installation of plug and/or key washer.
If boss and/or spacers are to be replaced see procedure B.

(a)If key washer was removed, install new key washer on boss. Bend tabs of key washer to secure to boss.

(b)Fully clean igniter plug threads with Material No.P11-027 to remove carbon deposits and thread lubricants.

CAUTION : DO NOT USE MATERIAL No.P06-023 ON THE IGNITER PLUG THREADS IF A DIFFERENT COMPOUND WAS USED BEFORE. IF MATERIAL No.P06-023 IS USED WHERE OTHER COMPOUNDS HAVE BEEN USED BEFORE, IT CAN BECOME HARD AFTER ENGINE OPERATION.

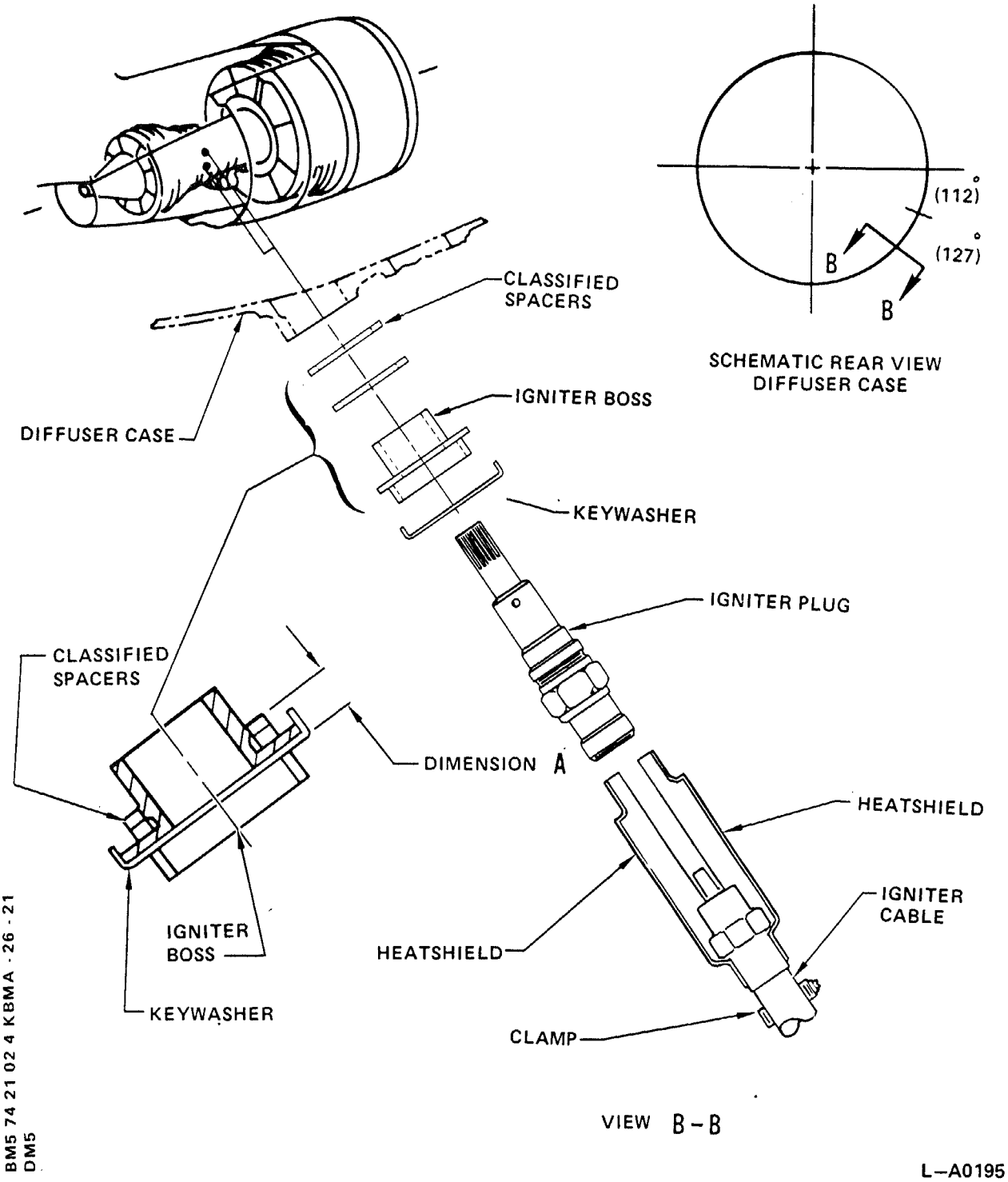
(c)Apply Material No.P06-023 to igniter plug threads. Apply Material No.P06-009 to threads of cable connector on the igniter plug end of the cable.

NOTE : Do not apply an excessive amount of lubricant to the igniter plug and to the exciter-to-igniter plug cable connector threads

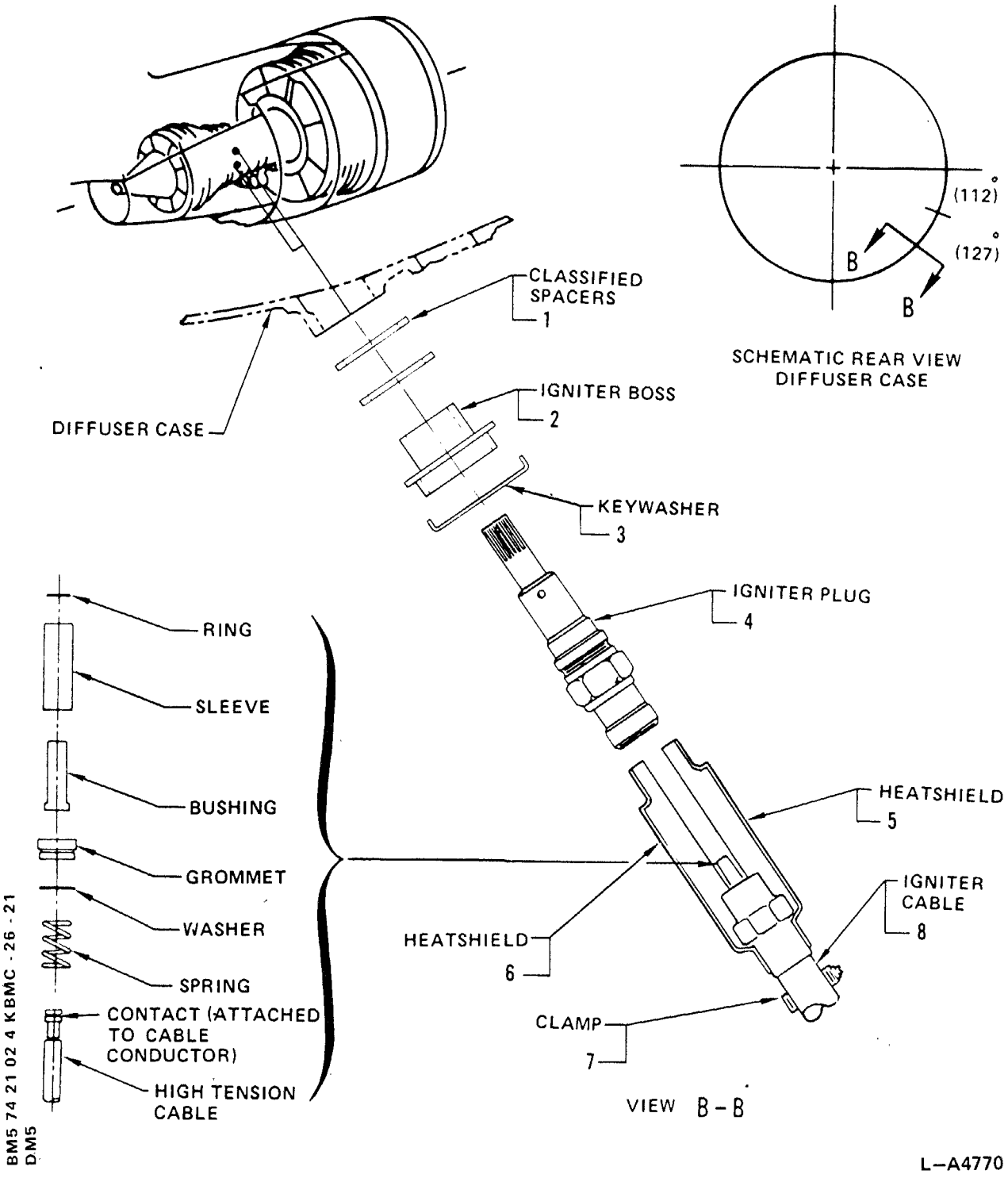
(d)Install igniter plug. Keep igniter plug boss from turning while tightening igniter plug. TORQUE plug to between 300 and 360 lbf.in. (3.39 and 4.07 m.daN).

(e)Remove protective cap from end of igniter cable, and from the connector on the exciter.

(f)Check cable contact for evidence of arcing (discoloration and heavy pitting). Check cable end for evidence of carbon tracking. Replace cable if either condition is found. (Ref. 74-21-01, P. Block 401).



Igniter Plug (Typical 2 locations) (Sheet 1/2)
Figure 402



Igniter Plug (Typical 2 locations) (Sheet 2/2)
Figure 402

(g)Install new grommet on cable end as follows :
1 Clean new grommet with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).
2 Slide grommet on cable.
(h)Install two clamps, smaller clamp first, on the exciter end of the cable.
(i)Install a clamp on the igniter plug end of the cable.
CAUTION : INSTALL THE CABLE ENDS (LEADS) TO THE IGNITER PLUG AND THE IGNITION EXCITER BY PUSHING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.
(j)Connect the coupling nut of the igniter plug end of the cable to the igniter plug. Keep the coupling nut loose sufficiently to permit free movement of the cable.
(k)Lubricate the threads of the coupling nut at the exciter end of the cable with Material No.P06-036 and connect the cable to the output connector on the exciter.
NOTE : When Material No.P06-036 is not available, an alternative lubricant (Material No.P06-021) can be used.
Do not apply an excessive amount of lubricant to the cable coupling nut threads.
(l)Torque the coupling nuts on the cable until the nuts touch (bottom) on the shoulder of nuts. This torque is usually to between 140 and 160 lbf.in. (1.581 and 1.807 m.daN).
(m)Install heat shield segments at igniter end of exciter-to-igniter plug cable and reposition securing clamp. Bottom heat shield on igniter plug boss.
(n)TORQUE clamp screw to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).
(o)Install the heat shields segments at the exciter end of the cable. Put the clamps over the heat shields and torque the clamp screws to between 15 and 18 lbf.in. (o.169 and 0.203 m.daN).
(p)Install the bolt, threads lubricated with Material P03-001, and nut that attach a clamp on the igniter cable (the upper or lower cable as necessary) to a bracket located between the upper and lower igniter cable. Torque the bolt to between 36 and 40 lbf.in. (0.406 and 0.451 m.daN).
(2)Igniter plug boss (procedure B) (Ref. Fig. 402) (Sheet 1/2)
(a)If key washer is being replaced, install new key washer to boss and bend tabs of key washer around flange of boss to secure in place.
(b)If igniter boss and/or classified spacers have been removed but will not be replaced continue with installation procedure step (c). If igniter boss and/or spacers are being replaced, check boss and spacer thickness and adjust classified spacer thickness if necessary as follows :
1 Install classified spacer(s) to boss and measure total thickness of parts shown (Ref. Fig. 402) (Sheet 1/2) Dimension A.
2 Compare total thickness of parts with identical dimension of old parts obtained at disassembly. If the assembly dimension is within plus or minus 0.015 in. (0.381 mm) of disassembly dimension no spacer adjustment is required. If assembly dimension is NOT within 0.015 in. (0.381 mm) of disassembly dimension select one or more clas-

sified spacers to equal disassembly dimension within plus or minus 0.010 in. (0.254 mm).
(Ref. Fig. 403). Use a maximum of two spacers per each igniter plug location
NOTE : Total combined thickness of spacers is not to exceed 0.300 in. (7.620 mm) at each igniter location.

(c) Fully clean plug threads and boss threads with Material No.P11-027 to remove carbon deposits and thread lubricants.

(d) Lubricate OD threads of boss with Material No.P06-023.

(e) Install classified spacer(s) to boss and install boss to diffuser case. TORQUE boss to between 375 and 440 lbf.in. (4.23 and 4.97 m.daN). Wirelock boss.

(f) Apply Compound, Material No.P06-023 to threads of igniter plug.
NOTE : Do not apply an excessive amount of lubricant to the igniter plug threads.

(g) Install igniter plug to boss. TORQUE plug to between 300 and 360 lbf.in.(3.39 and 4.07 m.daN).
NOTE : Keep igniter plug boss from turning while torquing plug.

(h) Remove protective caps from end of igniter plug cable and from the connector on the exciter.

(i) Check cable contact for evidence of arcing (discoloration and heavy pitting). Check cable end for evidence of carbon tracking. Replace cable if either condition is found. (Ref. 74-21-01, P. Block 401).

(j) Install new grommet on cable end as follows :
1 Clean new grommet with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).
2 Slide grommet on cable.
3 Apply Material No.P06-009 to threads of cable connector on the igniter end of the cable.
NOTE : Do not apply an excessive amount of lubricant to the cable connector threads.

(k) Install two clamps, smaller clamp first, on the exciter end of the cable.

(l) Install a clamp on the igniter plug end of the cable.
CAUTION : INSTALL THE CABLE ENDS (LEADS) TO THE IGNITER PLUG AND THE IGNITION EXCITER BY PUSHING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

(m) Connect the coupling nut of the igniter plug end of the cable to the igniter plug. Keep the coupling nut loose sufficiently to permit free movement of the cable.

(n) Lubricate the threads of the coupling nut at the exciter end of the cable with Material No.P06-036 and connect the cable to the output connector on the exciter.
NOTE : When Material No.P06-036 is not available, an alternative lubricant (Material No.P06-021) can be used.
Do not apply an excessive amount of lubricant to the cable coupling nut threads.

(o) Torque the coupling nuts on the cable until the nuts touch (bottom) on the shoulder of nuts. This torque is usually to between 140 and 160 lbf.in. (1.581 and 1.807 m.daN).

(p)Install heat shield segments at igniter plug end of exciter-to-igniter plug cable and reposition securing clamp. Bottom heat shield on igniter plug boss.
(q)TORQUE clamp screw to between 15 and 18 lbf.in. (0.17 and 0.20 m.daN).
(r)Install the heat shields segments at the exciter end of the cable. Put the clamps over the heat shields and torque the clamp screws to between 15 and 18 lbf.in. (0.169 and 0.203 m.daN).
(s)Install the bolt, threads lubricated Material No.P03-001, and nut that attach a clamp on the igniter cable (the upper or lower cable as necessary) to a bracket located between the upper and lower igniter cable. Torque the bolt to between 36 and 40 lbf.in. (0.406 and 0.451 m.daN).

(3)Igniter plug boss (procedure C) (Ref. Fig. 403, 404, 405) (Ref. Fig. 406)

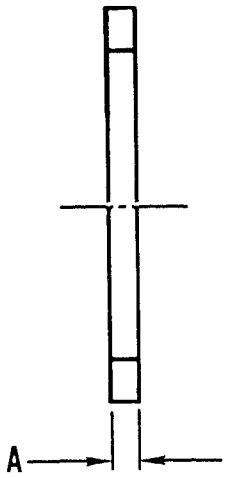
NOTE : This procedure applies to both igniter plug locations. If boss or spacer(s) are to be replaced, and parts removed at disassembly are not available, igniter plug immersion depth must be determined using this procedure. If none of the above parts are to be replaced, install igniter plug (See procedure A).

NOTE : If boss or spacer(s) are to be replaced, and parts removed at disassembly are available, check boss and spacer thickness (See procedure B).

(a)If necessary, clean threads of boss (2) using PWA24524 tap. (Ref. Fig. 404, 405, 406)
(b)Install new key washer (4) to igniter boss (2) with tabs toward boss (Ref. Fig. 404, 405, 406).
(c)Install boss and key washer to igniter plug (3) fingertight (Ref. Fig. 404, 405, 406).
(d)Measure Dimension A from plug tip to bottom face of boss (Ref. Fig. 404, 405, 406). Record Dimension A.
(e)Disassemble key washer and boss from igniter plug and place on bench.
(f)Using a strong light, look in igniter boss hole in diffuser case and determine which igniter plug guide configuration (shielded or unshielded) is installed in outer combustion chamber (Ref. Fig. 404, 405, 406).

NOTE : Presently, there are two igniter plug guide configurations installed in outer combustion chambers. Prior configuration chambers incorporate extended sleeve (6) and no shield (Ref. Fig. 404). Later configuration chambers incorporate a flush sleeve and a shield (6) (Ref. Fig. 405). Talon Low Emission burners incorporate only a lock (6) (Ref. Fig. 406).

(g)Measure igniter plug immersion depth using PWA75509 Immersion Gage, (5) (Ref. Fig. 404, 405, 406).
1 Using detail gage master (7), place master between gage hook and gage base. Set gage indicator bezel to zero (Ref. Fig. 404, 405, 406).
2 Insert gage into the igniter boss hole in diffuser case until gage base is seated on face of case boss.
3 Rotate gage base to obtain an uninterrupted view of dial gage face.
4 Holding gage base, rotate probe until notch in probe disk is pointing to rear of engine.
5 Depress probe and slide gage towards rear of engine to seat gage hook



PART NO.	DIMENSION A INCHES	DIMENSION A MILLIMETERS
741073 CL 1	OVER 0.008 - 0.018	OVER 0.20 - 0.46
741073 CL 2	OVER 0.018 - 0.028	OVER 0.46 - 0.71
741073 CL 3	OVER 0.028 - 0.038	OVER 0.71 - 0.97
741073 CL 4	OVER 0.038 - 0.048	OVER 0.97 - 1.22
741073 CL 5	OVER 0.048 - 0.058	OVER 1.22 - 1.47
741073 CL 6	OVER 0.058 - 0.068	OVER 1.47 - 1.73
741073 CL 7	OVER 0.068 - 0.078	OVER 1.73 - 1.98
741073 CL 8	OVER 0.078 - 0.088	OVER 1.98 - 2.24
741073 CL 9	OVER 0.088 - 0.098	OVER 2.24 - 2.49
741073 CL 10	OVER 0.098 - 0.108	OVER 2.49 - 2.74
741073 CL 11	OVER 0.108 - 0.118	OVER 2.74 - 3.00
741073 CL 12	OVER 0.118 - 0.128	OVER 3.00 - 3.25
741073 CL 13	OVER 0.128 - 0.138	OVER 3.25 - 3.51
741073 CL 14	OVER 0.138 - 0.148	OVER 3.51 - 3.76
741073 CL 15	OVER 0.148 - 0.158	OVER 3.76 - 4.01
741073 CL 16	OVER 0.158 - 0.168	OVER 4.01 - 4.27
741073 CL 17	OVER 0.168 - 0.178	OVER 4.27 - 4.52
741073 CL 18	OVER 0.178 - 0.188	OVER 4.52 - 4.78

SPACER CLASSIFICATION DATA

L-90275
0283

BM5 74 21 02 4 KCMO - 26 - 21
DM5

Igniter Boss Classified Spacer
Figure 403

against rear I.D. surface of outer combustion chamber (8) (Ref. Fig. 404, 405, 406).

6 Release probe and record dial gage reading. Add the gage reading to 2.2 in. (55.88 mm) if reading is a plus reading. Subtract the gage reading from 2.2 in. (55.88 mm) if reading is a minus reading. Result is Dimension B.

7 For engines incorporating combustion chamber with extended sleeve (6) and no shield, add 0.025 in. (0.635 mm) to Dimension B and subtract that total from Dimension A. The resulting dimension, Dimension C, is the desired spacer thickness (Ref. Fig. 404).

8 Select a classified spacer (1) or combination of spacers to obtain Dimension C plus or minus 0.010 in. (0.254 mm). Use a maximum of two spacers per plug. Total combined thickness of spacer(s) not to exceed 0.300 in. (7.620 mm) (Ref. Fig. 404, 403).

9 For engines incorporating combustion chambers with flush sleeve and a shield (6), add 0.125 in. (3.175 mm) to Dimension B and subtract that total from Dimension A. The resulting dimension, Dimension C, is the desired spacer thickness (Ref. Fig. 405).

10 For engines with Talon Low Emission combustion chambers there is a flush sleeve and a lock (6). Add 0.075 in. (1.905 mm) to Dimension B and subtract that total from Dimension A. The resulting dimension, Dimension C, is the desired spacer thickness (Ref. Fig. 406).

11 Select a classified spacer (1) or combination of spacers to obtain Dimension C plus or minus 0.010 in. (0.254 mm). Use a maximum of two spacers per plug. Total combined thickness of spacer(s) not to exceed 0.300 in. (7.620 mm) (Ref. Fig. 405, 403, 406).

12 If necessary, clean threads in diffuser case port using PWA27641 tap.

13 Install key washer (3) to igniter boss (2) and bend tabs over to secure.

14 Fully clean plug threads with Material No.P11-027 to remove carbon deposits and thread lubricants.

15 Lubricate OD threads of boss with Material No.P06-023.

16 Install previously selected classified spacer(s) to boss and install boss to diffuser case. TORQUE boss to between 375 and 440 lbf. in. (4.23 and 4.97 m.daN). Wirelock boss.

17 Apply Material No.P06-023 to threads of igniter plug.

18 Install igniter plug to boss. TORQUE plug to between 300 and 360 lbf. in. (3.34 and 4.07 m.daN).

NOTE : Keep igniter plug boss from turning while torquing plug.

19 Remove protective closure from the cable ends and the connector on the exciter.

20 Check cable contact for evidence of arcing (discoloration and heavy pitting). Check cable end for evidence of carbon tracking. Replace cable if either condition is found (Ref. 74-21-01, P. Block 401).

21 Install new grommet on cable as follows :
- Clean new grommet with a SPOP 208 solvent (Ref. 70-00-00, P. Block 201).
- Slide grommet on cable.
- Apply Material No.P06-009, to threads of cable nut on the igniter plug end of the cable.

22 Install two clamps, smaller clamp first, over exciter end of the cable

(8) (Ref. Fig. 402).

23 Install a clamp (7) on the igniter plug end of the cable (8).

CAUTION : INSTALL THE CABLE ENDS (LEADS) TO THE IGNITER PLUG AND THE IGNITION EXCITER BY PUSHING THE CABLE CONNECTORS IN A STRAIGHT LINE MOVEMENT. IF LATERAL FORCE IS PERMITTED, THE CABLE END CAN BE DAMAGED.

24 Connect the coupling nut of the igniter plug end of the cable to the igniter plug (4). Keep the coupling nut loose sufficiently to permit free movement of the cable.

25 Lubricate the threads of the coupling nut at the exciter end of the cable with Material No.P06-036 and connect the cable to the output connector on the exciter.

NOTE : When Material No.P06-036 is not available, an alternative lubricant (Material No.P06-021) can be used.
Do not apply an excessive amount of lubricant to the cable coupling nut threads.

26 Torque the coupling nuts on the cable until the nuts touch (bottom) on the shoulder of nuts. This torque is usually to between 140 and 160 lbf.in. (1.581 and 1.807 m.daN).

NOTE : Insufficient torque on cable nuts can cause ignition radiated noise to be picked up by aircraft radio equipment.

27 Install heat shields (5) and (6) at igniter plug (4). Bend tabs of igniter plug heat shields into groove in boss (2) before securing clamp (7). Secure with clamp. TORQUE clamp screw to between 15 and 18 lbf. in. (0.17 and 0.20 m.daN) (Ref. Fig. 402) (Sheet 2/2).

28 Install the heat shields segments at the exciter end of the cable. Put the clamps over the heat shields and torque the clamp screws to between 15 and 18 lbf.in. (0.169 and 0.203 m.daN).

29 Install the bolt, threads lubricated with Material No.P03-001, and nut that attach a clamp on the igniter cable (the upper or lower cable as necessary) to a bracket located between the upper and lower igniter cable. Torque the bolt to between 36 and 40 lbf.in. (0.406 and 0.451 m.daN).

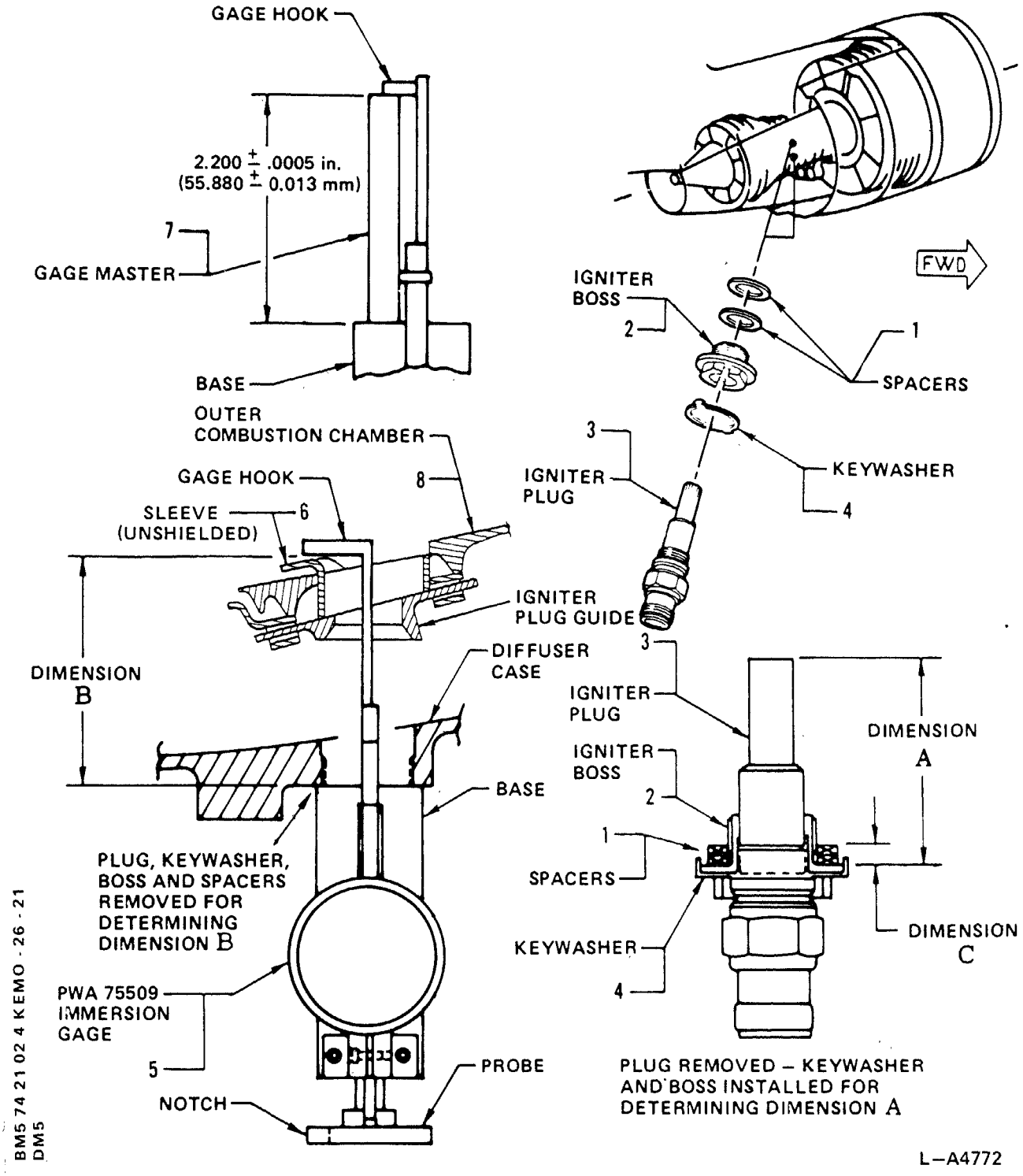
D. Close-Up and Test

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

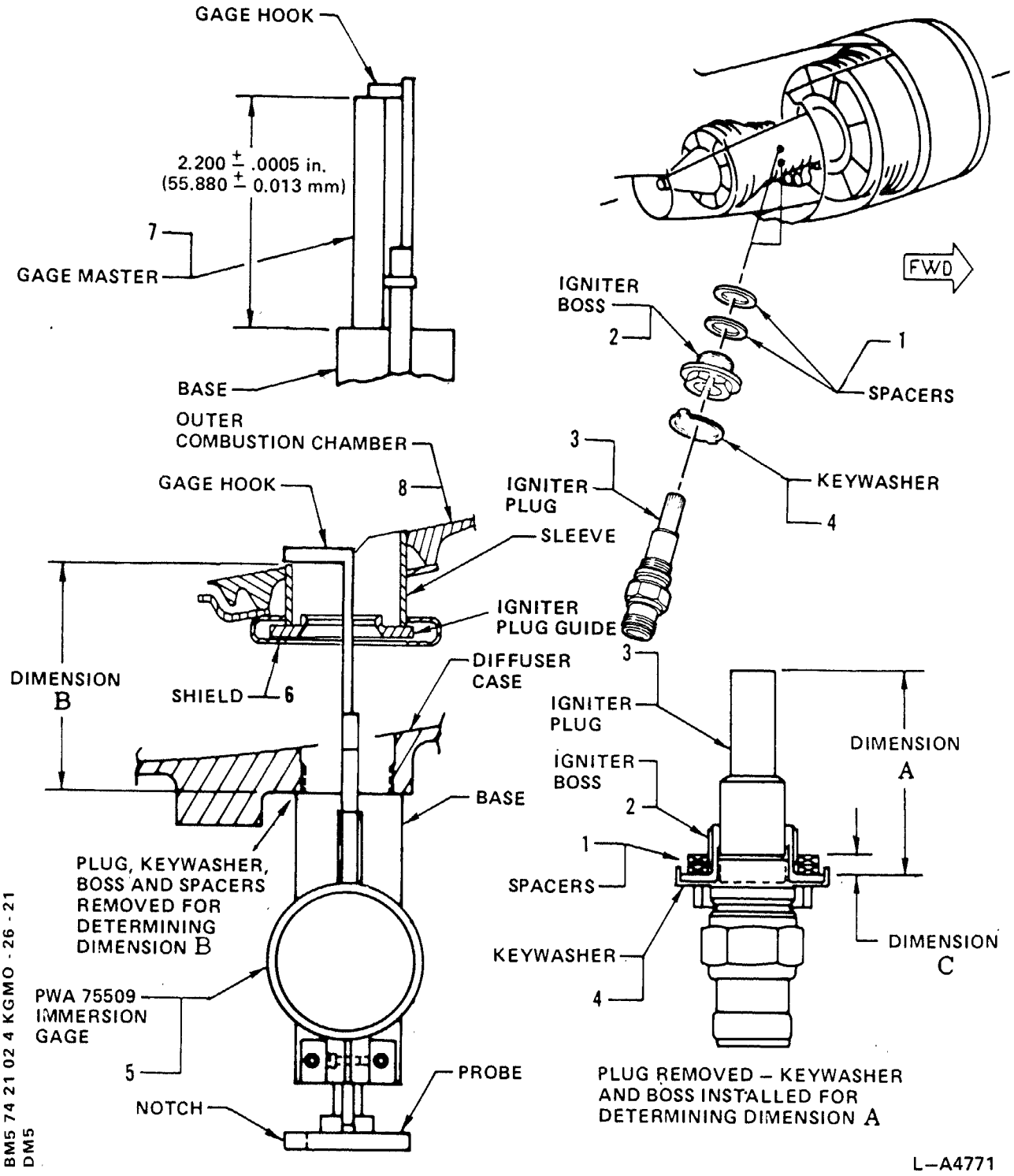
(2)Remove access platform.

(3)Remove safety clips and tags and close circuit breakers. Close right thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301).

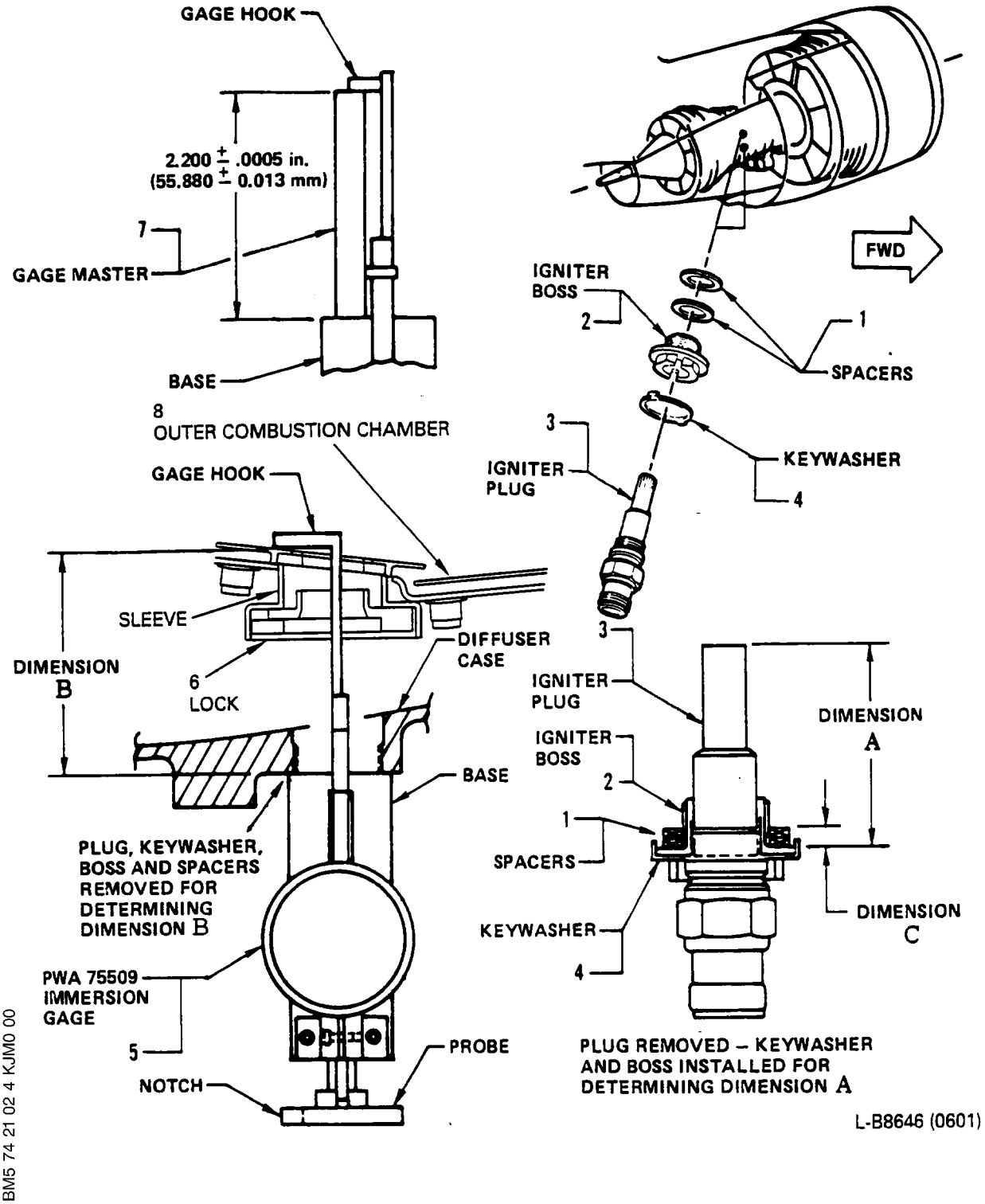
(4)Test engine per Test Reference Table (Ref. 71-00-00, P. Block 501).



Igniter Plug Immersion Depth Measurement for Engines
Incorporating Extended Sleeve
Figure 404



Igniter Plug Immersion Depth Measurement for Engine Not Incorporating Extended Sleeve
Figure 405



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Igniter Plug Immersion Depth Measurement for Engines
Talon Low Emission Burner
Figure 406

IGNITER PLUG - INSPECTION/CHECK

1. Equipment and Materials

ITEM	DESIGNATION
A.	Circuit Breaker Safety Clips
B.	Thread Chasing Die 1.000-20NS
C.	Thread Chasing Die 0.9375-16NS
D.	Service Wear Measuring Tool CT-492 or CT-468
Referenced Procedures	
- 71-13-00, P. Block 301	Cowl Doors
- 74-21-02, P. Block 701	Igniter Plug
- 74-21-02, P. Block 401	Igniter Plug

2. Procedure (Ref. Fig. 601)

A. Job Set-Up
(1)Open, safety and tag circuit breaker for the appropriate engine and open fan and thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(2)Remove igniter plug (Ref. 74-21-02, P. Block 401).

B. Clean igniter plug (Ref. 74-21-02, P. Block 701).

C. Visually inspect coupling threads and shell threads of igniter plug. Damaged threads can be cleaned-up using 1.000-20NS Thread Chasing Die for coupling threads and 0.9375-16NS Thread Chasing Die for shell threads.

D. Inspect ceramic for cracks on either end of plug. Any cracks in ceramic are cause for rejection of igniter plug. Internal ceramic breaks may be detected by shaking plug and listening for rattle.
CAUTION : WHEN PLUG IS EXCESSIVELY ERODED, BROKEN CERAMIC MAY BE INGESTED BY TURBINE.

E. Inspect plug end for erosion by using lighted magnifying glass to determine if insulator supporting shoulder is worn through. Wear may be measured using CT-492 (or CT-468) Service Wear Measuring Tool.
NOTE : Visual determination of excessive wear is also a practical means of evaulating plug wear. Maximum outer shell ID erosion is a physical limit to prevent possible loss of ceramic retention by ground shell.

F. Inspect plug for erosion in area shown (Ref. Fig. 601). Plugs worn beyond 0.030 in. (0.762 mm) depth in area shown shall be rejected.
NOTE : Igniter plug erosion is proportional to total firing time. Although igniters will continue to fire after exceeding erosion limits, the voltage required to fire the igniter increases to a level that can stress other ignition components, particularly the high tension lead.

G. Whenever high tension lead is removed from igniter plug terminal, inspect

plug terminal well. Inspection should consist of following :

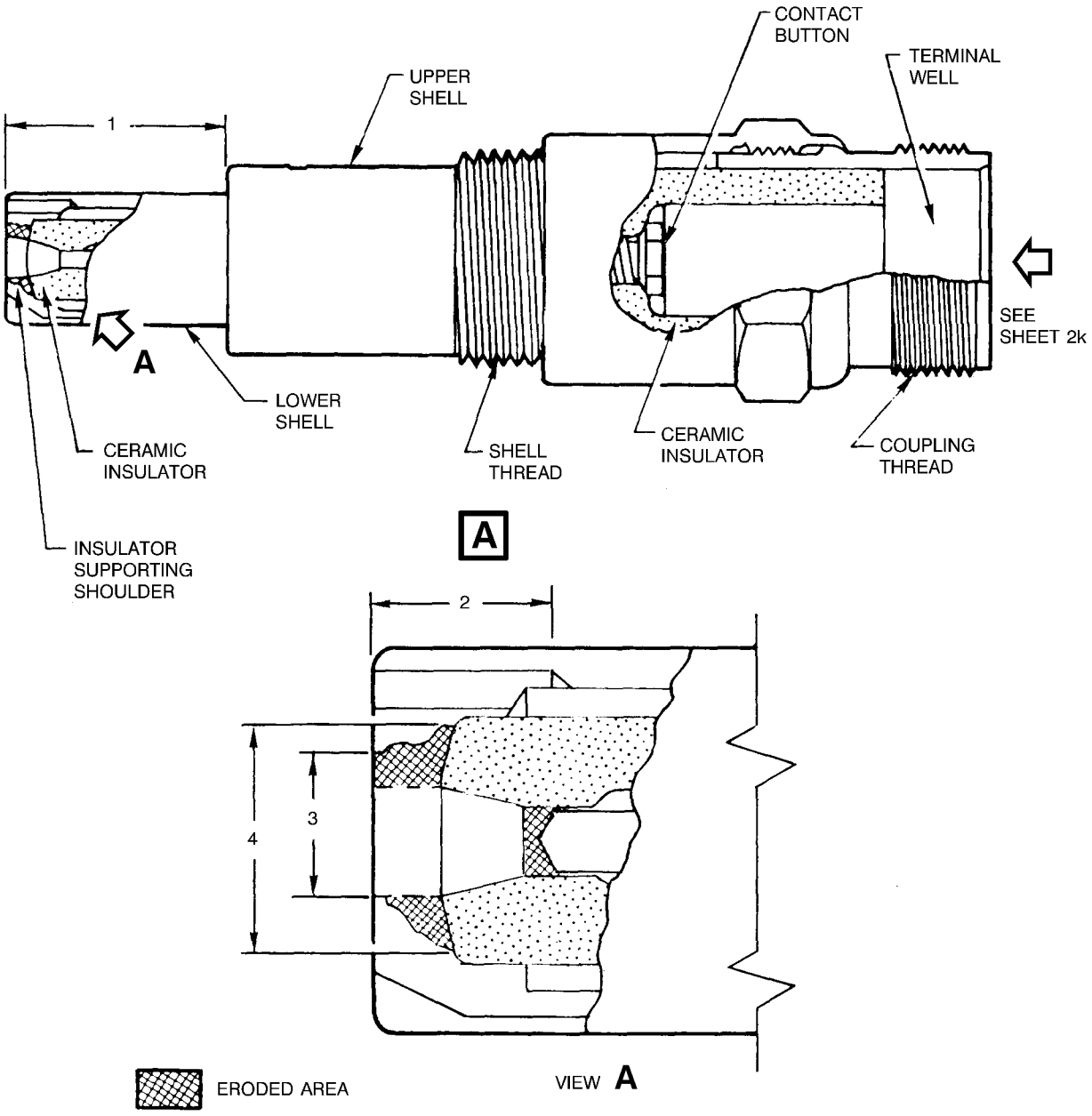
(1)Inspect plug terminal well for evidence of arcing and/or flashover. Arcing is identified by pitting or discoloration on contact button. Minor arcing can be removed (Ref. 74-21-02, P. Block 701). Flashover is Flashover is identified by carbon tracking.
If any of these indications are evident, replace igniter plug.

(2)Inspect plug terminal well for presence of oil, dirt and conductive contaminants. Remove contamination (Ref. 74-21-02, P. Block 701).

H. Close-Up

(1)Install igniter plug (Ref. 74-21-02, P. Block 401).

(2)CLose thrust reverser and fan cowl doors, remove safety clips and tags and close circuit breakers (Ref. 71-13-00, P. Block 301).



EROSION LIMITS

1. 0.03in. (0.76mm) MAXIMUM DEPTH EROSION IN THIS AREA.
2. ABRASION THROUGH COOLING AIR HOLE NOT PERMITTED.
   PIECE THAT MIGHT BREAK OFF NOT PERMITTED.
3. 0.3in. (7.6mm) DIAMETER MAXIMUM SHELL EROSION.
4. 0.34in. (8.6mm) DIAMETER MAXIMUM UNDERCUT EROSION.

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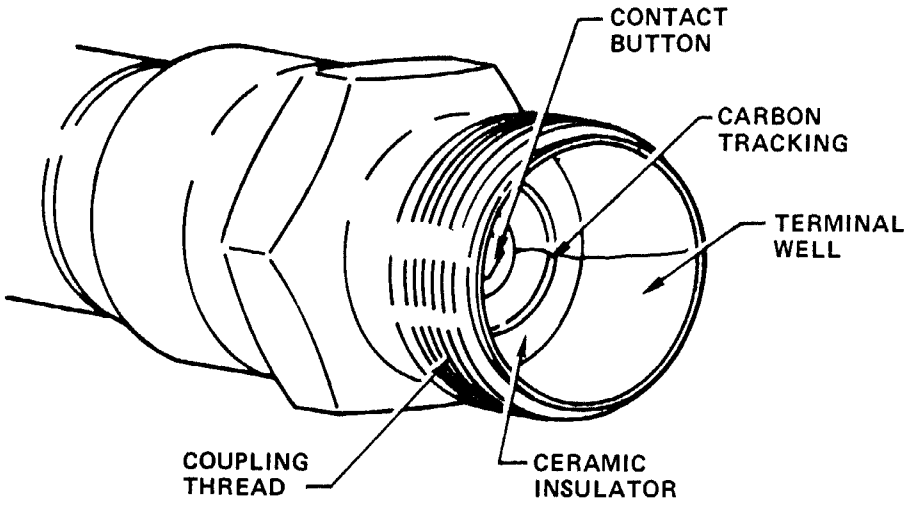
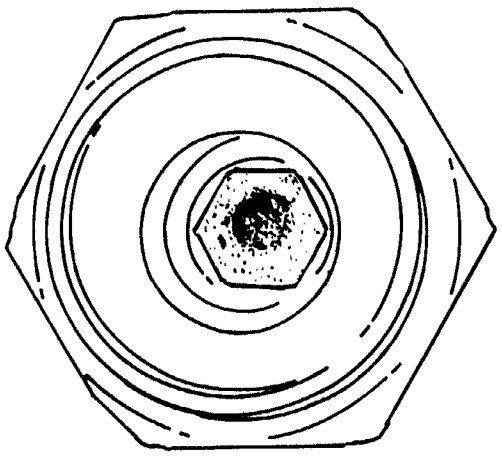
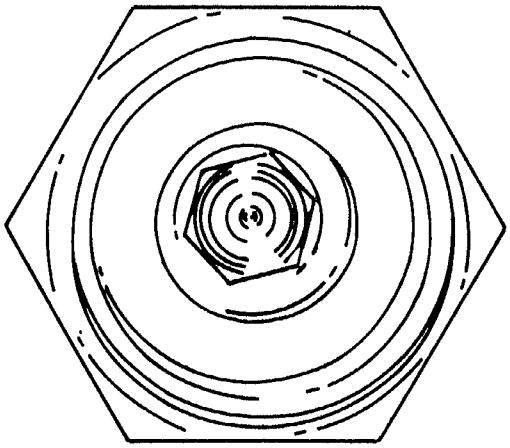
Igniter Plug Inspection (Sheet 1/3)
Figure 601





ARCING ON CONTACT BUTTON

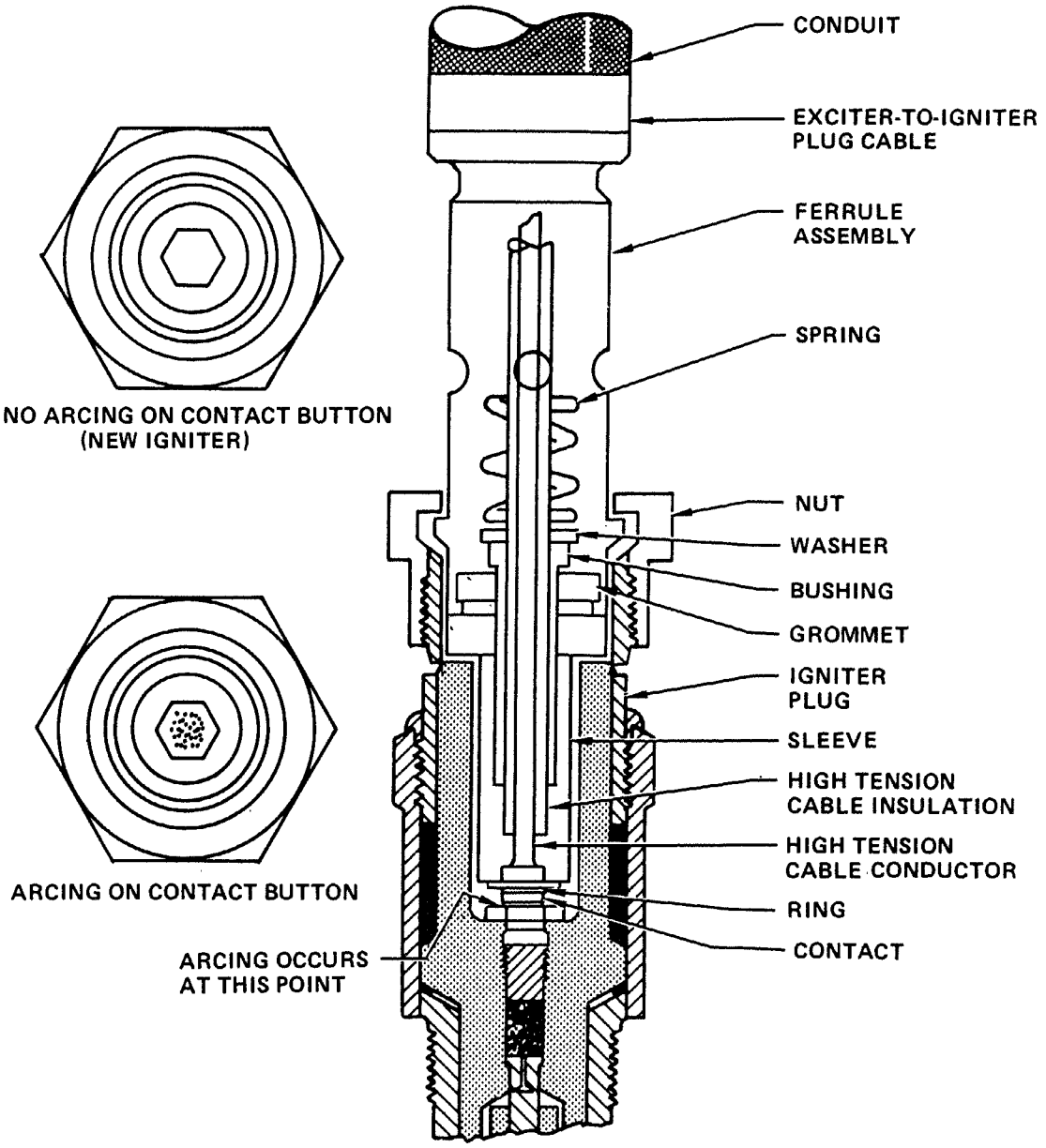


NO ARCING ON CONTACT BUTTON
(NEW INGITER)

BM5 74 21 02 6 KAMB - 23

L-A3661

Igniter Plug Inspection (Sheet 2/3)
Figure 601



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DM5

Igniter Plug Inspection (Sheet 3/3)
Figure 601

IGNITER PLUG - CLEANING/PAINTING

1. Equipment and Materials

ITEM	DESIGNATION
A. Material No.P05-050	Special Materials (Ref. 70-00-00)
Referenced Procedures	
- 70-00-00, P. Block 201	Engine - Standard Pratices
- 74-21-02, P. Block 401	Igniter Plug

2. Procedure

NOTE : For Removal/Installation procedure refer to 74-21-02, P. Block 401.

WARNING : CLEANING SOLVENT IS FLAMMABLE. USE IN WELL VENTILATED AREA. AVOID CONTACT WITH SKIN.

A. Outer Shell

(1) Degrease igniter plug in solvent (Ref. 70-00-00, P. Block 201), SPOP 208, or equivalent.

NOTE : Cleaning of recessed center electrode cavity on firing end of igniter plug is not recommended.

(2) Clean outer shell of igniter plug using wire brush.

(3) Using solvent (Ref. 70-00-00, P. Block 201), SPOP 208, and nonmetallic brush, remove deposits from external surface of firing end of igniter plug. It is not necessary to restore ceramic to cleanliness of new ceramic surface.

B. Contact Well

(1) Remove dirt or foreign matter from inside contact well with compressed air.

NOTE : Compressed air shall be maintained at 30 psig (2.07 bars) maximum discharge pressure. Dirt on contact surface will cause reduced output or arcing.

(2) Minor arcing of the contact button can be removed by resurfacing the button with abrasive rod, Material No.P05-050, using a circular movement of the hand.

WARNING : USE CLEANING SOLVENT IN WELL-VENTILATED AREA. AVOID CONTACT WITH SKIN.

(3) Clean igniter plug contact well with long bristle, nonmetallic brush moistened with solvent (Ref. 70-00-00, P. Block 201), SPOP 208, or equivalent. Dry with compressed air.

(4) Clean inner ceramic walls using circular felt bob, 1/2 in. (12.7 mm) in diameter and approximately 1 3/4 in. (44.450 mm) long, suitable for use with hand chuck. Moisten with solvent (Ref. 70-00-00, P. Block 201), SPOP 208 and clean using circular movement of hand.

(5) Clean end surface of ceramic at seat of grommet face using short bristle nonmetallic brush moistened with solvent (Ref. 70-00-00, P. Block 201), SPOP 208. Dry with compressed air.

1. Description
(Ref. Fig. 001)

Monitoring of ignition systems is done from **ENG** panel (**429VU**) located on the overhead panel.
An ignition switch allows the crew to select either or both systems, as required, provided that the corresponding **HP** fuel shut off valve control lever (located on center pedestal **9VU**) is in **ON** position.

A. With ignition selector switch in **OFF** or **CRANK** position no ignition system is powered for any engine. The **OFF** position is the normal position while **CRANK** is used for wet or dry motoring (Ref. 80-00-00).

B. With ignition selector switch in **START A** position both **A** systems for engines 1 and 2 are activated, (engine 2 system **A** via normal busbar **202XP**, engine 1 system **A** via normal busbar **105XP**), provided that the corresponding **HP** fuel shut off valve is open, and **N2** below **45%**.

C. With ignition selector switch in **START B** position and the same conditions as above, both **B** systems for engines 1 and 2 are activated via emergency busbar **403XP**.

D. With ignition selector switch in **CONT RELIGHT** position, both **A** and **B** systems of each engine are activated, provided that the **HP** fuel shut-off valve is open. Selection of **CONT RELIGHT** is recommended every time the ambient conditions can cause an engine flame out (heavy rain, inflight relight, take-off and go around (if required). But to prolong the service life of the ignition system components, it is recommended to limit the usage of continuous relight.

NOTE : In order to avoid any hidden fault, it is recommended during ground start procedure to use alternately **A** and **B** systems.
Any faulty engine start should be reported to the maintenance personnel so that a corrective action may be undertaken.

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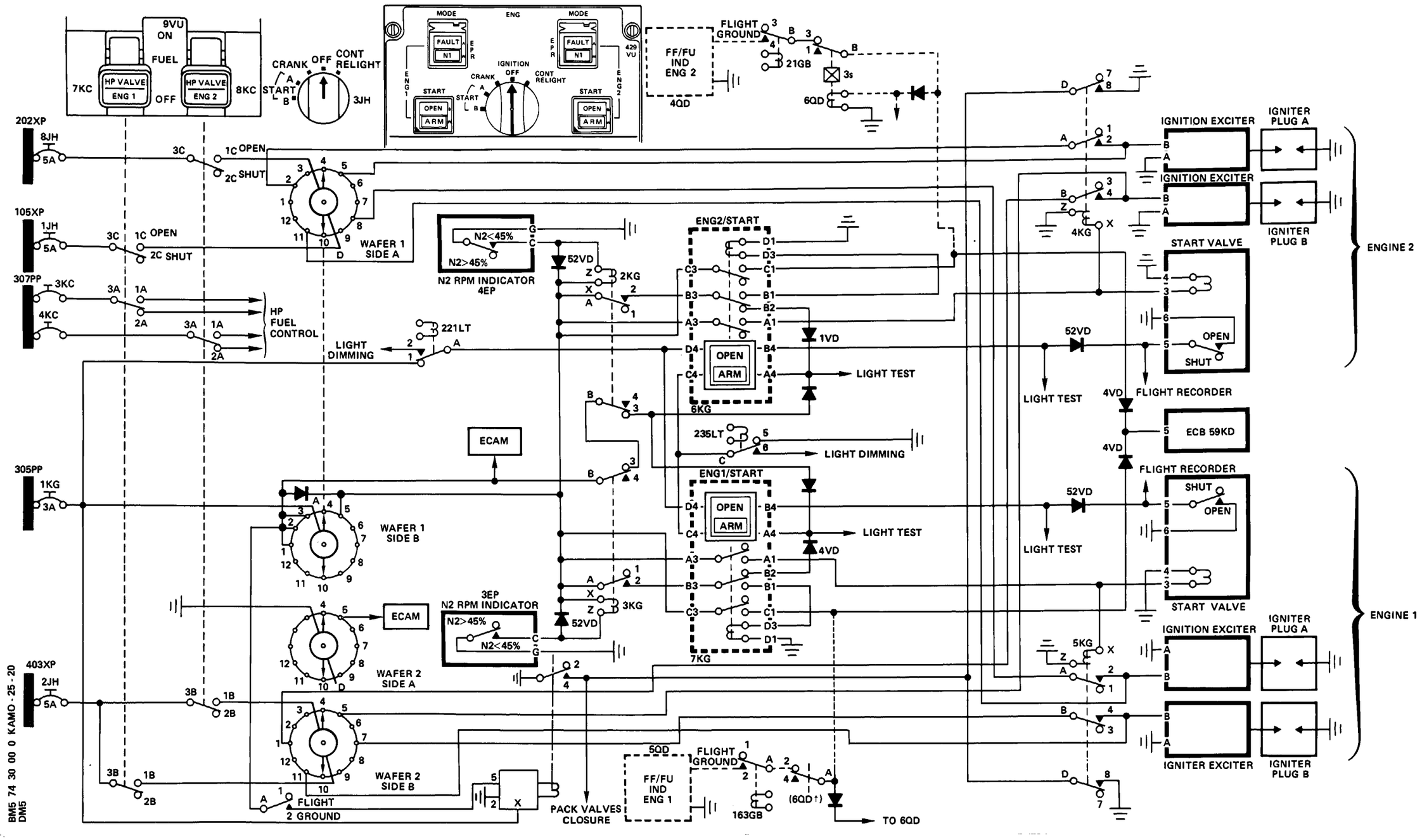

Ignition System
Figure 001